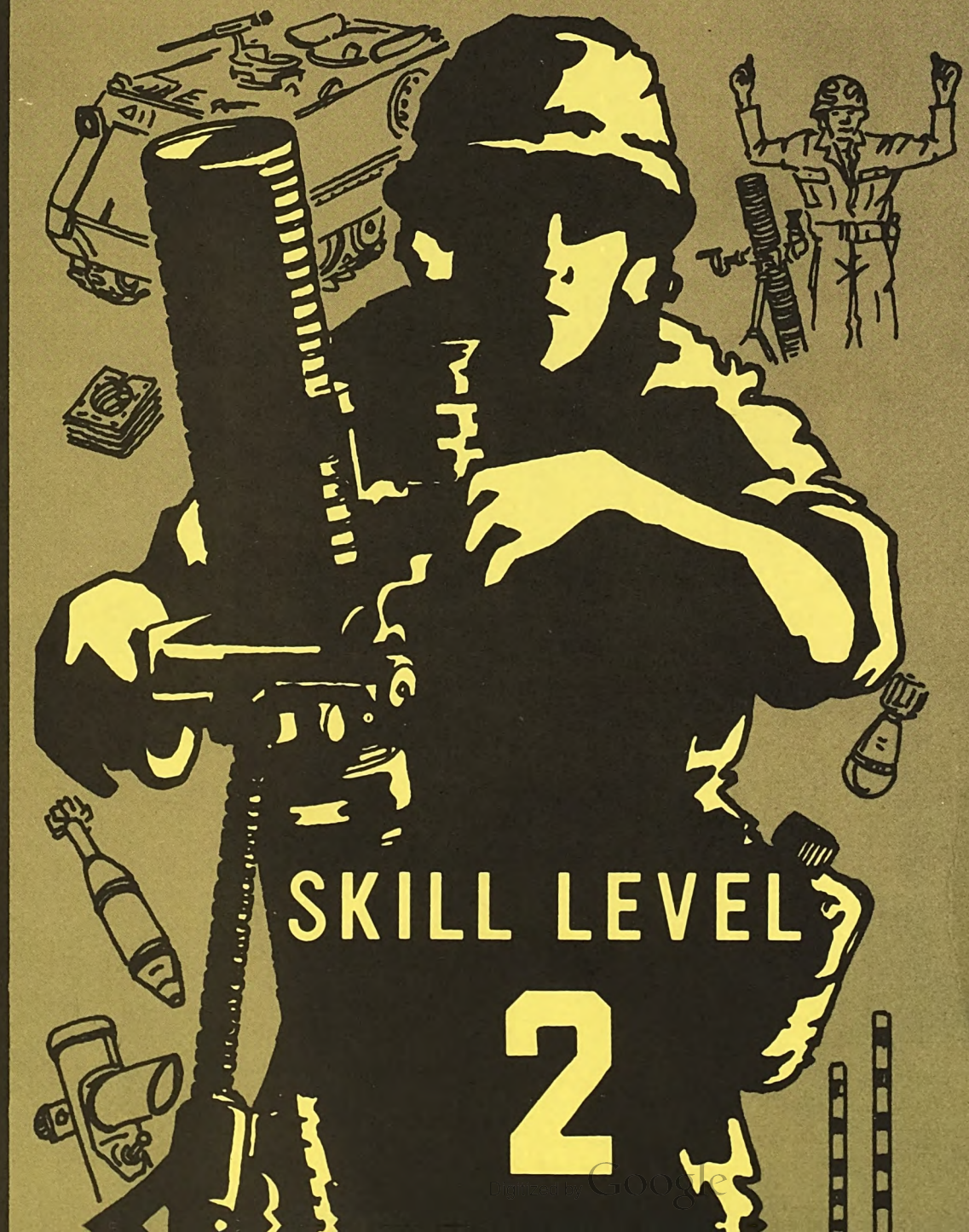
SOLDIER'S MANUAL

11C20 - INDIRECT FIRE INFANTRYMAN



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COMMANDERS ATTENTION

Distribute this manual to each soldier in MOS 11C skill levels 1 - 4.

The Soldier's Manual is designed to tell the soldier what tasks he must be proficient in to be MOS qualified. If the soldier follows the road map it provides, he should progress readily to positions of responsibility commensurate with his aptitude and motivation.

Initial distribution of Soldier's Manuals will be "pushed" down to the unit level, based upon assigned strength in the particular MOS and skill level. In the event additional manuals are needed by the unit for MOS study, libraries or other training needs, DA Form 17 (Request for Publications) may be sent directly to the US Army Publications Center, 2800 Eastern Boulevard, Baltimore, Maryland 21220.

The individual soldier is responsible for retaining and maintaining his manual. Soldier's Manuals are designed on the modular system. Each skill level manual builds upon the other. As an example, a skill level 3 soldier needs manuals 1 through 4. Levels 1 through 3 tell the level 3 soldier what he needs to know for proficiency at this present skill level. The skill level 4 manual tells him what he must be able to do at the next skill level. The point is - he needs all 4 manuals to know all he needs to know.

Upon promotion to grades E5, E6, E7, or E8, the soldier must order his next higher level manual directly from the preparing agency identified in this manual.

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RESERVE COMPONENTS

ARMY NATIONAL GUARD—ARMY RESERVE

This page is information for you the Reserve Component soldier. This Soldier's Manual, as published, is representative of the critical tasks to be performed by the Active Army soldier in your MOS on equipment available in the Active Army inventory.

Most tasks in this manual *are applicable to you* without changes. However, some tasks may require modification due to differences of equipment, facilities and training time available to you.

By now, you are probably wondering why this special page. This is to inform you that due to time constraint, this soldier's manual has not undergone a review process necessary to make it equitable to you the Reserve Component soldier. In the meantime, you will be using this manual along with your Active Army counterpart. Future publications of soldier's manuals will undergo the necessary review process. This manual will be included in that review and if applicable, change sheets will be published and distributed to you.

Many tasks that you learned in BCT and AIT are in this manual. There are other critical tasks that you are responsible to learn on your own. Training references/materials are available and can be provided to you through your unit. This is where your initiative comes into play. It is to your advantage to take the initiative NOW. Your performance in your duty position will be based on your ability to perform all the critical tasks for which you are accountable.

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SECTION VII
TACTICAL VEHICLES

	PAGE
A. Wheeled Vehicles	2-VII-A-1
B. Tracked Vehicles	2-VII-B-1

SECTION VIII
MORTAR GUNNERY

A. 81-mm Mortar (Ground)	2-VIII-A-1
B. 81-mm Mortar (Carrier)	2-VIII-B-1
C. 107-mm (4.2-in) Mortar (Ground)	2-VIII-C-1
D. 107-mm (4.2-in) Mortar (Carrier)	2-VIII-D-1
E. General	2-VIII-E-1

SECTION IX
LEADERSHIP AND TRAINING

A. Leadership	2-IX-A-1
B. Training	2-IX-B-1

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FM 7-11C2
HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 30 July 1976

SOLDIER'S MANUAL 11C
INDIRECT FIRE INFANTRYMAN SKILL LEVEL 2

Table of Contents

PAGE

CHAPTER 1. INTRODUCTION(S) AND ROAD MAP(S)

SECTION I

A. INTRODUCTION (Skill Level 1) - The Soldier's Manual, What It Is and How to Use It. 1-I-A-1

B. ROAD MAP FOR INDIRECT FIRE INFANTRYMAN SKILL LEVEL 1 - Outline of MOS and Duty Position Responsibilities. 1-I-B-1

SECTION II

A. INTRODUCTION (SKILL LEVEL 2) - The Soldier's Manual, What it is and How to use it. 1-II-A-1

B. ROAD MAP FOR INDIRECT FIRE INFANTRYMAN SKILL LEVEL 2 - Outline of MOS and Duty Position responsibilities. 1-II-B-1

CHAPTER 2. TRAINING AND EVALUATION OUTLINES

SECTION I

BATTLEFIELD SURVIVAL

A. First Aid 2-I-A-1

B. Nuclear, Biological, and Chemical 2-I-B-1

C. Individual Fitness 2-I-C-1

SECTION II

COMBAT TECHNIQUES

A. Camouflage, Cover, and Concealment 2-II-A-1

B. Basic Individual Techniques 2-II-B-1

C. Security and Intelligence 2-II-C-1

D. Land Navigation 2-II-D-1

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SECTION III
WEAPONS

	PAGE
A. M16A1 Rifle	2-III-A-1
B. M203 Grenade Launcher	2-III-B-1
C. M72A2 LAW	2-III-C-1
D. Caliber .45 Pistol	2-III-D-1
E. Hand Grenades, Mines, and Demolitions	2-III-E-1
F. Caliber .50 Machinegun	2-III-F-1

SECTION IV

A. Forward Observer Procedures	2-IV-A-1

SECTION V
COMPUTING

A. M16 Plotting Board	2-V-A-1
B. Firing Chart	2-V-B-1

SECTION VI
COMMUNICATIONS

A. Radio	2-VI-A-1
B. Telephone	2-VI-B-1

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SOLDIER'S MANUAL

11C20 - INDIRECT FIRE INFANTRYMAN
Skill Level 2

The new Table of Contents, Introduction, and Tasks contained in this document provides for upgrading and updating FM 7-11C1 to form FM 7-11C2 for Skill Level 2 soldiers (E-5s).

FM 7-11C1, 30 July 1976, is updated as follows:

1. **Remove the following from FM 7-11C1:**

Front Cover
Table of Contents ..... Pages I & II

2. **Insert the following pages as indicated below:**

MAJOR AREA	ADD PAGES	AFTER PAGE
Front Cover - SL2	N/A	N/A
Table of Contents - SL2	Pages I, II & III	Cover
SL2 Introduction and Road Map	Section II Divider thru 1-II-B-12	1-I-B-9
Camouflage, Cover, and Concealment	2-II-A-7 thru 2-II-A-8.2	2-II-A-6.2
Security and Intelligence	2-II-C-5 thru 2-II-C-9.2	2-II-C-4.3
Land Navigation	2-II-D-5 thru 2-II-D-11.1	2-II-D-4.1
FORWARD OBSERVER PROCEDURES	2-IV-3 thru 2-IV-9.1	2-IV-2.1
COMPUTING	2-V-A-3 thru 2-V-B-5.2	2-V-A-2.2
MORTAR GUNNERY	2-VIII-E-1 thru 2-VIII-E-6.1	2-VIII-D-11.1
All remaining pages (Leadership and Training)	Section IX Divider Sheet thru 2-IX-B-1.1	2-VIII-E-6.1

3. **File this change sheet in front of the publication for reference purposes.** The proponent agency of this field manual is the United States Army Infantry School. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to Commandant, United States Army Infantry School, ATTN: ATSH-I-V-IT, Fort Benning, Georgia, 31905.

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CHAPTER 1

INDIRECT FIRE INFANTRYMAN

SECTION II

SKILL LEVEL TWO
INTRODUCTION AND ROAD MAP

FM 7-11C2

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HOW TO USE THE SOLDIER'S MANUAL FOR SKILL LEVEL 2

BASIC TASKS

The Soldier's Manual for Skill Level 2 soldiers (grade E5) contains basic combat tasks that all 11C20 Indirect Fire Infantrymen must be able to perform. These tasks are listed on the Road Map for Skill Level 2 under "BASIC TASKS FOR ALL SKILL LEVEL 2 INDIRECT FIRE INFANTRYMEN." The Road Map will tell you the page on which each task can be found.

MANDATORY TASKS

Tasks that are marked "MANDATORY" will receive priority in training and will be among those tested on the Skill Qualification Tests. Additional mandatory tasks may be added later.

ADDITIONAL TASKS FOR SELECTED DUTY POSITIONS

Your duty position may require you to be able to do some add-on tasks. The table below lists the duty positions which require add-on tasks and the number of add-on tasks required. A list of tasks for each duty position and the page on which each task can be found is listed on the Road Map for Skill Level 2 under "ADDITIONAL TASKS FOR SELECTED DUTY POSITIONS."

DUTY POSITION	NUMBER OF TASKS
81-mm Mortar Squad Leader (Ground Mounted)	23
81-mm Mortar Squad Leader (Carrier Mounted)	31
4.2-in Mortar Squad Leader (Ground Mounted)	23
4.2-in Mortar Squad Leader (Carrier Mounted)	31
*Computer, M16 Plotting Board	5
*Computer, Firing Chart	7
*Forward Observer	7

***NOTE: If assigned a vehicle, personnel are held responsible for tasks pertaining to that vehicle.**

Refer to the introduction to Skill Level 1, pages 1-I-A-5,6, and 7 for an explanation of the Training and Evaluation Outlines.

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HOW TO MAKE SERGEANT E6

The Army will only promote men who prove that they can do the job. In other words, you must show that you can do the tasks required of a staff sergeant before you can be considered for promotion to that grade. Here is how the system works:

1. LEARN THE TASKS IN THIS MANUAL that apply to you. As soon as you have done that, ask for a copy of the 11C30 Soldier's Manual **(for Skill Level 3).**

2. Then LEARN THE BASIC TASKS AND ADDITIONAL SKILLS FOR SELECTED DUTY POSITIONS IN THE SKILL LEVEL 3 MANUAL. It will not be as many as you might think since many of the skills that you learned for Skill Level 2 will also be in the Skill Level 3 manual.

3. As an E5, you will TAKE A SKILL QUALIFICATION TEST (SQT). The SQT will test your ability to do the tasks in the Soldier's Manual. If you make a high enough score on the test, you will be given the Skill Level 3 rating which you must have before you are promoted to E6. Since the SQT will use the same conditions and standards used in the Soldier's Manual, you will be able to prepare in advance for the SQT.

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4. The SQT has three parts: written, hands-on, and task certification. Sixty to ninety days before the SQT is given, an SQT notice will be sent to each unit. It will tell which tasks will be tested in each part of the SQT. It will also tell how the task will be tested. There are three different ways to test a task. First, you may be asked to answer a **written question** about how a task is performed. You will pick the correct answer from a list of answers and mark the correct answer on a machine-scoreable answer sheet. Second, you may be asked to actually do the task. For example, you may be given an M72A2 LAW and be asked to prepare it for firing. This is called a **"hands-on" test** which means you are actually required to do the task as you would on the job. Third, your unit commander may observe your performance of a task and report your ability to perform it as part of your SQT score. Your performance on all three parts of the test will be reported to you sometime soon after you complete the SQT. You will be told on which tasks you did not perform well. You can use your Soldier's Manual to improve your performance in those areas.

5. Also while you are an E5, you may ATTEND THE BASIC NON-COMMISSIONED OFFICER'S COURSE (**BNCOC**). In this course, you will build on the skills you developed during unit training and gain leadership experience to help you perform more effectively.

6. In addition to the SQT, you will RECEIVE AN ENLISTED EFFICIENCY REPORT (**EER**). In the EER, your supervisor will give his opinion of your performance on the job. Both the SQT and the EER will be used to determine your final evaluation score.

7. If you don't understand any parts of the manual or want to know more about advancement opportunities, see your section leader/FDC chief. Take advantage of his knowledge and experience.

8. At the top of your enlisted chain of command is your sergeant major. He is an expert in helping younger soldiers learn about training, evaluation, and the system for getting ahead in the Army. As such, he is responsible for insuring that your NCOs either provide the assistance you need or refer you to him for his guidance and help.

9. The Army wants and needs well-trained soldiers who desire to advance through the ranks. This manual and the willing assistance of senior NOCs are the tools you can use, to your advantage and the Army's.

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ROAD MAP

FOR
INDIRECT FIRE INFANTRYMEN SKILL LEVEL 2

BASIC TASKS FOR ALL
SKILL LEVEL 2 INDIRECT FIRE INFANTRYMEN
BATTLEFIELD SURVIVAL

	PAGE
FIRST AID	
Apply the four life-saving measures (clear the air-passages, stop the bleeding, treat for shock, protect the wound).	2-I-A-1
Apply first-aid measures for burns.	2-I-A-2
NUCLEAR, BIOLOGICAL, AND CHEMICAL	
Maintain protective mask and accessories.	2-I-B-1
Put on a protective mask.	2-I-B-2
Take cover as protection against NBC hazards.	2-I-B-3
Decontaminate self and individual equipment.	2-I-B-4
Administer antidote to a nerve-agent casualty.	2-I-B-5
Apply artificial respiration to a chemical-agent casualty.	2-I-B-6
Determine personnel needs and personnel hygiene in a chemical environment.	2-I-B-7
Identify NBC hazards and take appropriate actions.	2-I-B-8
INDIVIDUAL FITNESS	
Maintain individual physical fitness appropriate to unit mission.	2-I-C-1

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CAMOUFLAGE, COVER, AND CONCEALMENT	PAGE
Camouflage/conceal self and individual equipment.	2-II-A-1
Camouflage/conceal equipment.	2-II-A-2
Camouflage/conceal defensive positions.	2-II-A-3
Select temporary battlefield positions.	2-II-A-4
Construct individual defensive positions.	2-II-A-5
Clear fields of fire.	2-II-A-6
Construct mortar position.	2-II-A-7
Supervise/evaluate construction of individual positions.	2-II-A-8
BASIC INDIVIDUAL TECHNIQUES	
Move as a member of a dismounted mortar squad (81-mm mortar).	2-II-B-1
Move under direct fire.	2-II-B-2
React to indirect fires.	2-II-B-3
React to flares.	2-II-B-4
Move over, through, or around obstacles.	2-II-B-5
Estimate range.	2-II-B-6
SECURITY AND INTELLIGENCE	
Use challenge and password.	2-II-C-1
Process known or suspected enemy personnel.	2-II-C-2
Collect/report information - SALUTE.	2-II-C-3
Conduct day and night surveillance without the aid of electronic devices.	2-II-C-4
Identify threat vehicles and equipment.	2-II-C-5
Enforce noise, light, and litter discipline.	2-II-C-6
Emplace and recover field-expedient warning devices.	2-II-C-7
Emplace/recover pyrotechnic early warning devices.	2-II-C-8
Emplace/recover electronic anti-intrusion devices.	2-II-C-9

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LAND NAVIGATION	PAGE
Determine azimuth using an M2 compass.	2-II-D-1
Determine the grid coordinates of a point on a military map using the military grid reference system.	2-II-D-2
Determine the elevation of a point on the ground using a map.	2-II-D-3
Identify terrain features (natural and manmade) on the map.	2-II-D-4
Determine distance while moving between two points on the ground.	2-II-D-5
Determine a magnetic azimuth between two known points on the ground.	2-II-D-6
Determine a grid azimuth between two given points on a map.	2-II-D-7
Convert a magnetic azimuth to a grid azimuth (or grid azimuth to magnetic azimuth).	2-II-D-8
Measure a ground distance on a map.	2-II-D-9
Determine a location on the ground.	2-II-D-10
Navigate from one position on the ground to another point.	2-II-D-11

WEAPONS

M16A1 RIFLE

Maintain an M16A1 rifle, magazines, and ammunition.	2-III-A-1
Load and unload an M16A1 rifle magazine.	2-III-A-2
Load, reduce a stoppage, unload, and clear an M16A1 rifle.	2-III-A-3
Zero an M16A1 rifle.	2-III-A-4
Engage targets with an M16A1 rifle.	2-III-A-5

M203 GRENADE LAUNCHER

Maintain an M203 grenade launcher and ammunition.	2-III-B-1
Load, unload, and clear an M203 grenade launcher.	2-III-B-2

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PAGE

Zero an M203 grenade launcher. 2-III-B-3

Engage targets with an M203 grenade launcher and apply immediate action to reduce a stoppage. 2-III-B-4

LIGHT ANTI-TANK WEAPON (LAW)

Prepare an M72A2 LAW for firing; restore M72A2 LAW to carrying configuration. - MANDATORY TASK 2-III-C-1

Engage targets with an M72A2 LAW. - MANDATORY TASK 2-III-C-2

Apply immediate action to correct a malfunction on an M72A2 LAW. 2-III-C-3

CALIBER .45 PISTOL

Maintain caliber .45 pistol and ammunition. 2-III-D-1

Load, reduce a stoppage, unload, and clear caliber .45 pistol. 2-III-D-2

Engage targets with a caliber .45 pistol. 2-III-D-3

HAND GRENADES, MINES, AND DEMOLITIONS

Maintain hand grenades. 2-III-E-1

Engage enemy targets with hand grenades. 2-III-E-2

Install/recover an electrically armed claymore mine. 2-III-E-3

Fire a claymore mine. 2-III-E-4

Detect enemy mines. 2-III-E-5

FORWARD OBSERVER PROCEDURES

Call for/adjust indirect fire (using grid coordinate method of target location and bracketing method of adjustment). 2-IV-1

Call for/adjust indirect fire using the creeping method of adjustment. 2-IV-2

COMPUTING

M16 PLOTTING BOARD

Prepare M16 plotting board for operation and determine initial firing data for mortars (pivot point). 2-V-A-1

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	PAGE
Process subsequent FO corrections using M16 plotting board (pivot point).	2-V-A-2

COMMUNICATIONS

RADIOS

	PAGE
Maintain tactical FM radios (AN/PRC-77, AN/VRC-64, and AN/GRC-160).	2-VI-A-1
Maintain tactical FM radios (AN/VRC-46 and AN/VRC-47).	2-VI-A-2
Prepare/operate tactical FM radios (AN/PRC-77, AN/VRC-64 and AN/GRC-160).	2-VI-A-3
Prepare/operate tactical FM radios (AN/VRC-46 and AN/VRC-47).	2-VI-A-4
Use Communication Electronics Operating Instructions (CEOI) extract to determine callsigns, frequencies, and item number identifiers.	2-VI-A-5
Authenticate transmission and encrypt/decrypt numbers and grid zone letters using the Kal 61 with KTC 1400 numerical code.	2-VI-A-6
Encode and decode messages using the tactical operation code, KTC-600.	2-VI-A-7
Establish and enter or leave a radio net.	2-VI-A-8
Transmit and receive radio messages.	2-VI-A-9

TELEPHONES

Maintain field telephones (TA-1 and TA-312).	2-VI-B-1
Install/operate field telephones (TA-1 and TA-312).	2-VI-B-2

LEADERSHIP AND TRAINING

LEADERSHIP

Inspect personnel/equipment.	2-IX-A-1
Supervise maintenance on individual and TOE equipment.	2-IX-A-2

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	PAGE
Enforce preventive medicine program (includes personal hygiene).	2-IX-A-3
Supervise subordinates.	2-IX-A-4
TRAINING	
Conduct a performance oriented training session.	2-IX-B-1

ADDITIONAL TASKS FOR SELECTED DUTY POSITIONS - SKILL LEVEL 2

81-MM MORTAR SQUAD LEADER (GROUND MOUNTED)

Place a ground mounted 81-mm mortar into action.	2-VIII-A-1
Boresight 81-mm mortar.	2-VIII-A-2
Perform safety checks on 81-mm mortar.	2-VIII-A-3
Lay mortar for deflection and elevation.	2-VIII-A-4
Prepare 81-mm mortar ammunition for firing.	2-VIII-A-5
Maintain 81-mm mortar and associated fire control equipment.	2-VIII-A-6
Remove a misfire from the 81-mm mortar.	2-VIII-A-7
Engage target using fire without FDC.	2-VIII-A-8
Refer sight and realine aiming posts.	2-VIII-A-9
Reciprocally lay mortar using M2 aiming circle and place out aiming posts.	2-VIII-A-10
Manipulate mortar for traversing and searching fires.	2-VIII-A-11
Adjust fire without an FDC.	2-VIII-E-1
Lay mortar for direction using direct alinement method (fire without FDC).	2-VIII-E-2
Lay mortars for direction using M2 aiming circle.	2-VIII-E-3
Lay mortars for direction using M2 compass (ground mounted).	2-VIII-E-4
Supervise squad during the conduct of fire.	2-VIII-E-6
Drive a wheeled vehicle cross-country.	2-VII-A-1
Drive a wheeled vehicle on roads, in vehicle parks, and in built-up areas.	2-VII-A-2

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	PAGE
Drive a wheeled vehicle using blackout drive/ night vision devices.	2-VII-A-3
Start a wheeled vehicle engine using auxiliary power (M151, M715, M561).	2-VII-A-4
Perform an ESC (equipment serviceability criteria) inspection on a wheeled vehicle (M151, M715, M561).	2-VII-A-5
Maintain required TAMMS records on a wheeled vehicle (M151, M715, and M561).	2-VII-A-6
Perform operator maintenance on a wheeled vehicle.	2-VII-A-7

81-MM MORTAR SQUAD LEADER (CARRIER MOUNTED)

Place carrier mounted 81-mm mortar into action.	2-VIII-B-1
Boresight 81-mm mortar.	2-VIII-B-2
Perform safety checks on 81-mm mortar.	2-VIII-B-3
Lay mortar for deflection and elevation.	2-VIII-B-4
Prepare 81-mm mortar ammunition for firing.	2-VIII-B-5
Maintain 81-mm mortar and associated fire control equipment.	2-VIII-B-6
Remove a misfire from the 81-mm mortar.	2-VIII-B-7
Engage target using fire without FDC.	2-VIII-B-8
Refer sight and realine aiming posts.	2-VIII-B-9
Reciprocally lay mortar using M2 aiming circle and place out aiming posts.	2-VIII-B-10
Manipulate mortar for traversing and searching fires.	2-VIII-B-11
Adjust fire without an FDC.	2-VIII-E-1
Lay mortar for direction using direct alinement method (fire without FDC).	2-VIII-E-2
Lay mortars for direction using M2 aiming circle.	2-VIII-E-3
Lay mortars for direction using M2 compass (carrier mounted).	2-VIII-E-5
Supervise squad during the conduct of fire.	2-VIII-E-6
Drive an APC cross-country.	2-VII-B-1
Drive an APC on roads, in vehicle parks, and in built-up areas.	2-VII-B-2

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	PAGE
Drive an APC with night vision devices, infrared equipment, and blackout drive.	2-VII-B-3
Operate an APC in water.	2-VII-B-4
Start the APC engine using auxiliary power.	2-VII-B-5
Perform a tracked vehicle ESC inspection.	2-VII-B-6
Maintain required TAMMS records on a tracked vehicle.	2-VII-B-7
Perform operator maintenance on an APC.	2-VII-B-8
Maintain caliber .50 machinegun and ammunition.	2-III-F-1
Load, reduce a stoppage, unload, and clear a caliber .50 machinegun.	2-III-F-2
Engage targets with a caliber .50 machinegun.	2-III-F-3
Set head space and timing on a caliber .50 machinegun.	2-III-F-4
Target/confirm targeting on a caliber .50 machinegun.	2-III-F-5
Mount/dismount an AN/TVS-2 sight on caliber .50 machinegun.	2-III-F-6
Boresight an AN/TVS-2 to caliber .50 machinegun.	2-III-F-7

107-MM (4.2-IN) MORTAR SQUAD LEADER (GROUND MOUNTED)

Ground mount 107-mm (4.2-in) mortar.	2-VIII-C-1
Boresight 107-mm (4.2-in) mortar.	2-VIII-C-2
Peform safety checks on 107-mm (4.2-in) mortar.	2-VIII-C-3
Lay mortar for deflection and elevation.	2-VIII-C-4
Prepare 107-mm (4.2-in) mortar ammunition for firing.	2-VIII-C-5
Maintain 107-mm (4.2-in) mortar and equipment.	2-VIII-C-6
Remove a misfire from the 107-mm (4.2-in) mortar.	2-VIII-C-7
Refer sight and realine aiming posts.	2-VIII-C-8
Reciprocally lay mortar using M2 aiming circle and place out aiming posts.	2-VIII-C-9
Manipulate mortar for traversing fire.	2-VIII-C-10

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	PAGE
Engage targets using fire without FDC.	2-VIII-C-11
Adjust fire without an FDC.	2-VIII-E-1
Lay 107-mm (4.2-in) mortar for direction using direct alinement method (fire without FDC).	2-VIII-E-2
Lay mortars for direction using M2 aiming circle.	2-VIII-E-3
Lay mortars for direction using M2 compass (ground mounted).	2-VIII-E-4
Supervise squad during the conduct of fire.	2-VIII-E-6
Drive a wheeled vehicle cross-country.	2-VII-A-1
Drive a wheeled vehicle on roads, in vehicle parks, and in built-up areas.	2-VII-A-2
Drive a wheeled vehicle using blackout drive/ night vision devices.	2-VII-A-3
Start a wheeled vehicle engine using auxiliary power (M151, M715, M561).	2-VII-A-4
Perform an ESC (equipment serviceability criteria) inspection on a wheeled vehicle (M151, M715, M561).	2-VII-A-5
Maintain required TAMMS records on a wheeled vehicle (M151, M715, M561).	2-VII-A-6
Perform operator maintenance on a wheeled vehicle.	2-VII-A-7
107-MM (4.2-IN) MORTAR SQUAD LEADER (CARRIER MOUNTED)	
Place carrier mounted 107-mm (4.2-in) mortar into action.	2-VIII-D-1
Boresight 107-mm (4.2-in) mortar.	2-VIII-D-2
Perform safety checks on 107-mm (4.2-in) mortar.	2-VIII-D-3
Lay mortar for deflection and elevation.	2-VIII-D-4
Prepare 107-mm (4.2-in) mortar ammunition for firing.	2-VIII-D-5
Maintain 107-mm (4.2-in) mortar and equipment.	2-VIII-D-6
Remove a misfire from the 107-mm (4.2-in) mortar.	2-VIII-D-7
Refer sight and realine aiming posts.	2-VIII-D-8
Reciprocally lay mortar using M2 aiming circle and place out aiming posts.	2-VIII-D-9

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	PAGE
Manipulate mortar for traversing fires.	2-VIII-D-10
Engage target using fire without FDC.	2-VIII-E-1
Adjust fire without an FDC.	2-VIII-E-1
Lay 107-mm (4.2-in) mortar for direction using direct alinement method (fire without FDC).	2-VIII-E-2
Lay mortars for direction using M2 aiming circle.	2-VIII-E-3
Lay mortars for direction using M2 compass (carrier mounted).	2-VIII-E-5
Supervise squad during the conduct of fire.	2-VIII-E-6
Drive an APC cross-country.	2-III-F-1
Drive an APC on roads, in vehicle parks, and in built-up areas.	2-III-F-2
Drive an APC with night vision devices, infrared equipment, and blackout drive.	2-III-F-3
Operate an APC in water.	2-III-F-4
Start the APC engine using auxiliary power.	2-III-F-5
Perform a tracked vehicle ESC inspection.	2-III-F-6
Maintain required TAMMS records on a tracked vehicle.	2-III-F-7
Perform operator maintenance on an APC.	2-III-F-8
Maintain caliber .50 machinegun and ammunition.	2-III-F-9
Load, reduce a stoppage, unload, and clear a caliber .50 machinegun.	2-III-F-10
Engage targets with a caliber .50 machinegun.	2-III-F-11
Set head space and timing on a caliber .50 machinegun.	2-III-F-12
Target/confirm targeting on a caliber .50 machinegun.	2-III-F-13
Mount/dismount an AN/TVS-2 sight on caliber .50 machinegun.	2-III-F-14
Boresight an AN/TVS-2 to caliber .50 machinegun.	2-III-F-15

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COMPUTING

COMPUTER (M16 PLOTTING BOARD)	PAGE
Prepare M16 plotting board for operation.	2-V-A-3
Determine firing data and process subsequent FO corrections for mortars using M16 plotting board.	2-V-A-4
Determine data for sheaf adjustment.	2-V-A-5
Determine data for re-registration and application of corrections.	2-V-A-6
Record information on firing data sheet (81-mm).	2-V-A-7
COMPUTER (FIRING CHART)	
Prepare a firing chart for operation and determine initial firing data.	2-V-B-1
Process subsequent FO corrections using the firing chart.	2-V-B-2
Determine data for sheaf adjustment.	2-V-B-3
Determine data for re-registration and application of corrections.	2-V-B-4
Record information on firing data sheet (107-mm).	2-V-B-5
Maintain auxiliary generator on M577 tracked vehicle.*	2-III-F-16
Install/operate auxiliary generator on M577 tracked-vehicle.*	2-III-F-17

*NOTE: Carrier mounted units only.

FORWARD OBSERVER

Call for/adjust a coordinated high explosive and illumination mission.	2-IV-3
Call for/adjust a screening mission.	3-IV-4
Determine vertical interval to adjust indirect fire.	2-IV-5
Assist unit commanders in the preparation of fire support plan.	2-IV-6

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	PAGE
Locate a point on the ground using the polar coordinate method.	**2-IV-7**
Prepare/operate an AN/TVS-4 (NOD).	**2-IV-8**
Adjust fire using an AN/TVS-4, (NOD).	**2-IV-9**

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TRAINING AND EVALUATION OUTLINE

TASK
CONSTRUCT MORTAR POSITION (81-MM, 4.2-IN)

EVALUATION

CONDITIONS:

In daylight, in a field environment, given load-bearing equipment, with bayonet, scabbard, intrenching tool, and mortar; the appropriate location and general direction of fire and amount of front to be covered.

STANDARDS:

Within time specified by supervisor, completed position must meet the following specifications:

1. Cover and Concealment: Affords protection from effects of indirect fire (shrapnel) and should be camouflaged well from aerial and ground observation.

2. Size and Shape: Conforms to the following specifications, shown in figure 1.

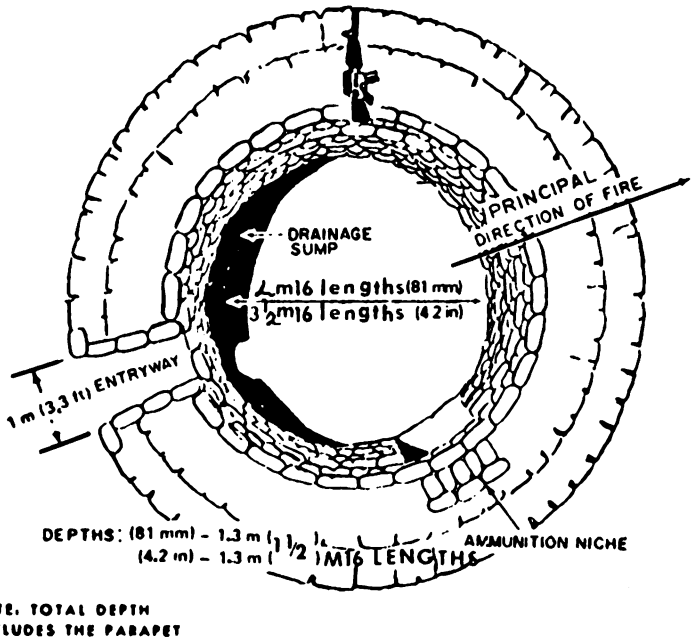
PRINCIPAL DIRECTION OF FIRE
DRAINAGE SUMP
1 m16 lengths(81 mm)
3 1/2 m16 lengths (4.2 m)
1 m (3.3 ft) ENTRYWAY
DEPTHS: (81 mm) - 1.3 m (1 1/2 M16 LENGTHS)
(4.2 m) - 1.3 m (1 1/2 M16 LENGTHS)
AMMUNITION NICHE
NOTE: TOTAL DEPTH INCLUDES THE PARAPET

Figure 1.

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TRAINING

Construction of a mortar position should generally follow this sequence:

1. You (the mortar squad leader) select the exact location for the tube. During your selection, keep in mind the use of natural camouflage. While camouflage is desirable, overhead clearance is necessary due to the high angle of fire, and this may require the trimming of tree limbs.

2. Next, dig in. The emplacement illustrated in figure 1 is circular. It is prepared to the dimensions shown with the sides of the emplacement sloping inward toward the bottom. The floor slopes to the drainage sump under the gap in the parapet. An ammunition ready rack, or niche, is built into the side of the emplacement so that it is convenient for the assistant gunner. The bottom of the ammunition rack is elevated from the floor of the emplacement. Another ready rack may be constructed in one side of the trench leading to the position. The initial emplacement is revetted using sandbags, and the improved emplacement is revetted using corrugated metal. Before constructing the parapet, the mortar is laid for direction of fire by the use of an aiming circle or alternate means. The parapet should be not more then 50 cm (20 in) high and a minimum of 90 cm (3 ft) wide. An exit trench may be constructed leading to personnel shelters and to other mortar positions.

a. The 81-mm Mortar. A pit type emplacement for the 81-mm mortar is shown in figure 1.

b. The 107-mm (4.2-in) Mortar. The 107-mm (4.2-in) mortar emplacement is identical to the one described above for the 81-mm mortar except for dimension changes shown in figure 1. While digging the position and making the parapet, keep in mind your aiming stakes. Since they will be outside of the hole, a portion of the parapet will have to be sloped forward so that you can see the aiming posts. The amount of the parapet that has to be sloped forward will depend on the area coverage you are responsble for.

NOTE: While the mortar position is being dug, it is important to insure that the mortar is properly laid and ready to fire. If the temporary mortar position is directly in front of or behind the emplacement under construction, then it will be easier to properly lay the tube after it is placed in the position.

TASK NUMBER: 071-11C-0707

REFERENCES:

FM 23-90, 81-mm Mortar
FM 5-15, Field Fortifications
FM 23-92, 4.2-Inch Mortar, M30

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TASK
SUPERVISE/EVALUATE CONSTRUCTION OF INDIVIDUAL POSITIONS.

EVALUATION

CONDITIONS:

In daylight, acting as a squad leader.

STANDARDS:

Insure that, within specified time limits, the position is completed and meets the following minimum requirements.

1. **Cover** - Affords protection from direct frontal small-arms fire (e.g., a natural or manmade frontal parapet high enough to protect your head completely while manning your weapon and at least one M16 length deep or its equivalent) and from effects of indirect fire (shrapnel) (normally requires at least 12 inches of dirt/log overhead protection).

2. **Concealment** - Position cannot be easily detected by aerial observation or from front (e.g., blends with surroundings well enough so that an approaching soldier approximately 35 meters to the front cannot detect it).

3. **Fields of Fire** - Limiting stakes are emplaced and correctly define sector of fire. Occupant in firing position has observation in sector and fields of fire which have been selectively cleared, but which have not destroyed natural camouflage so that position can be detected as specified in paragraph 2.

4. **Size/Shape** - Position is armpit deep and at least shoulder wide (of occupant), provides a cave-like compartment with overhead cover big enough for occupant to get under.

5. **Optional** - If time permits, position includes grenade sump, sloping floor with shallow trench to facilitate drainage, elbow holes to stabilize firing position and to lower silhouette when firing, range card, and night firing stakes.

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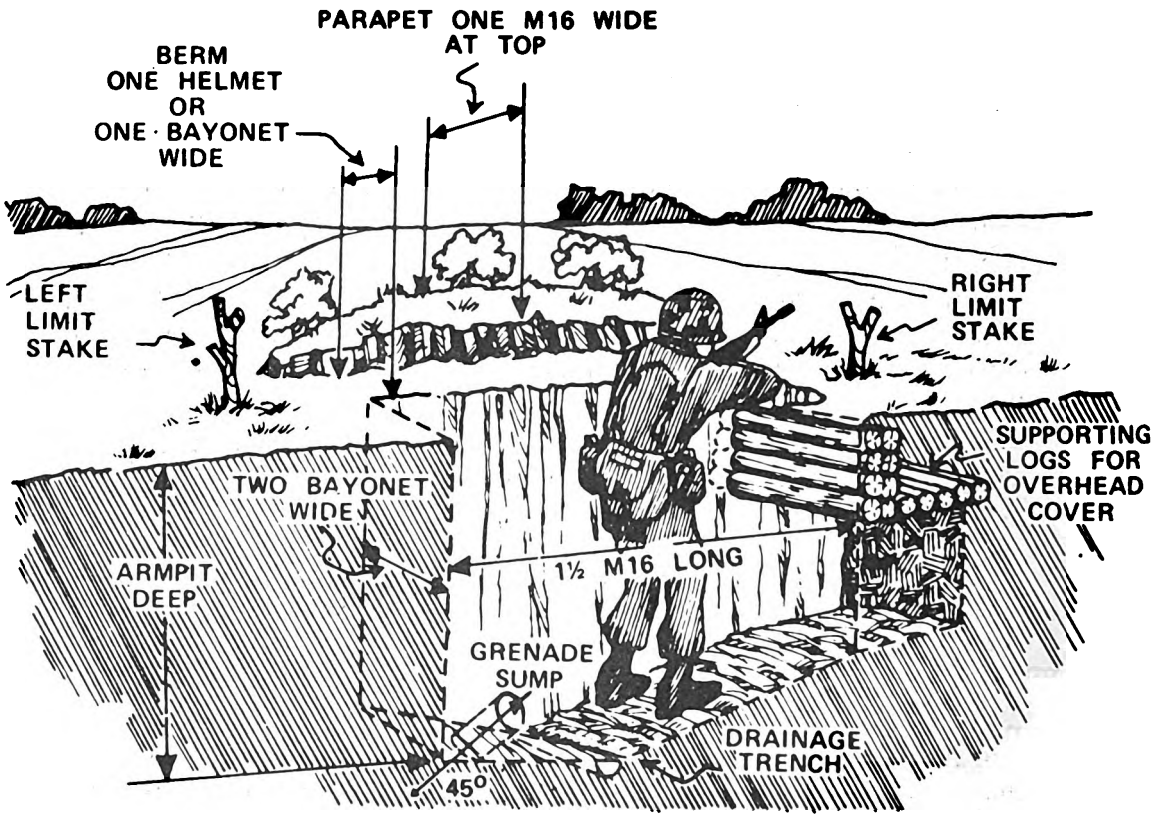

Figure 1.

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TRAINING

Through supervision, evaluation, and on-the-spot corrections, insure that the construction of the individual defensive position generally follows the following sequence:

1. Assign position location and sector of fire. Individual should emplace sector-of-fire stakes.

2. Individual should partially clear fields of fire within his sector and dig a hasty hole for minimum protection, being careful not to destroy natural camouflage around his position; he should save grass clumps, etc., for camouflage later.

3. Individual should next dig in, making hole armpit deep. If he has a natural frontal parapet, the dirt from hole should be carried away and camouflaged; if not, the dirt should be used to make a frontal parapet (see figure 1).

4. Individual can now complete clearing fields of fire; he should clear only what is absolutely necessary. Insure that individual gets in firing position and checks observation of fields of fire.

5. Individual should next camouflage his position using available materials (e.g., grass clumps, foliage, etc.), blending the position with the surroundings. The camouflage should be checked by moving approximately 35 meters to front and observing the position; if the position can be spotted easily, more work on camouflage is needed.

6. After all of the above have been accomplished satisfactorily, the individual should construct overhead cover. He should use logs, planks, etc., which will support at least 12 inches of dirt, and dig a cave-like area big enough to get under (see figure 1).

7. Upon completion of the overhead cover, the individual should begin to improve his position. Items to check for include grenade sump, drainage trench, elbow holes, night firing stakes, range card, and improvement of camouflage.

TASK NUMBER: 071-11A-0707
REFERENCE:

TC 7-50, Fighting Positions for Infantry Soldiers

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TRAINING AND EVALUATION OUTLINE

TASK

IDENTIFY THREAT VEHICLES AND WEAPONS

EVALUATION

CONDITIONS:

Given a mockup, model, or photograph of the T62, T55, MBP, BRDM2, PT76, BTR-60PB, manpacked sagger, AKM, PKM machinegun, RPG-7, and several NATO vehicles and weapons.

STANDARDS:

SITUATION 1: Identify each vehicle or weapon observed as being either friendly or threat.

SITUATION 2: Identify each vehicle or weapon observed by correct NATO nomenclature.

TRAINING

1. Note these common identification characteristics of both friendly and threat tanks:

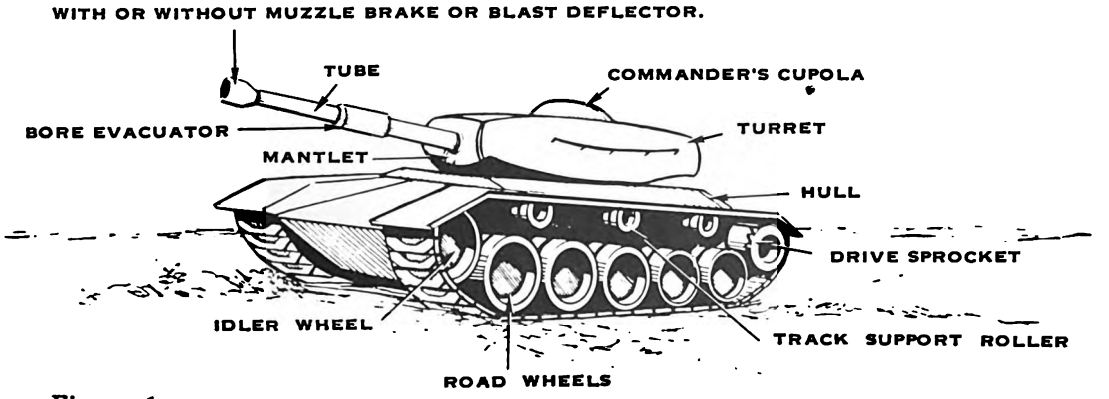

Figure 1.

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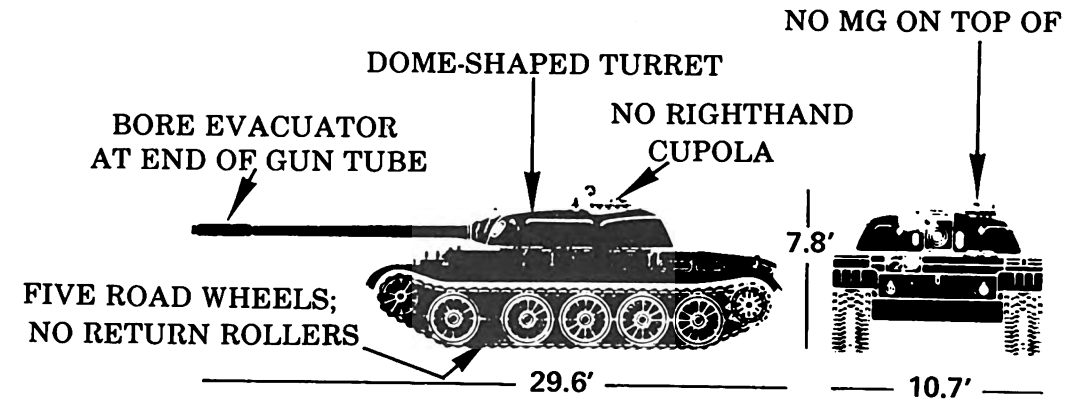
2. You must be able to recognize this equipment.



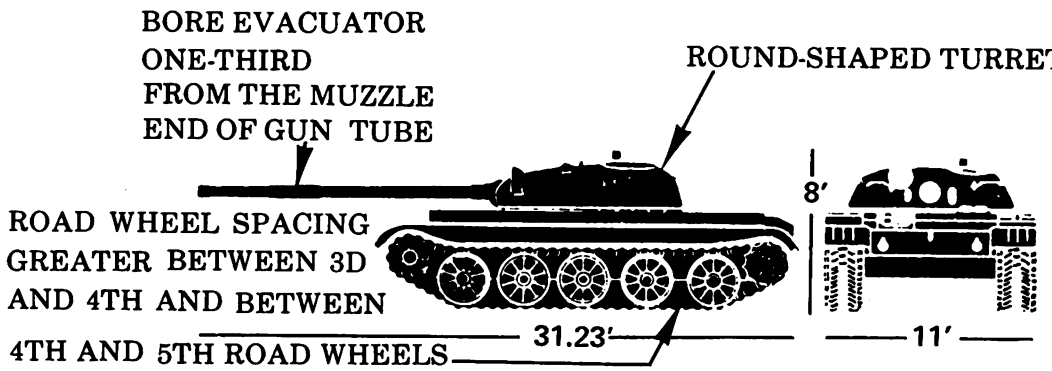
T - 55

SPACE BETWEEN 1ST
and 2D ROAD WHEEL

TECHNICAL CHARACTERISTICS	ROLE	WHERE ASSIGNED	REMARKS
Crew: 4 Weight: 36 tons Main Armament: 100mm gun Ammunition: APHE HEAT HE Effective Range: 1,500 meters	Main Battle Tank	3 per Tank Plt * 10 per Tank Co * 31 per Tank Bn * 95 per Tank Regt 215 per MR Div 316 per Tank Div	Improved T-54

Figure 2.

* 4 per plt/13 per Co/40 per Bn in the tank Bn of the motorized rifle regiment.



T - 62

TECHNICAL CHARACTERISTICS	ROLE	WHERE ASSIGNED	REMARKS
Crew: 4 Weight: 36.5 Tons Main Armament: 115mm Smooth-bore gun Ammunition: HEAT, APFSDS Effective Range: 2,000 meters	Main Battle Tank	Same as T-55	Current first line threat tank

Figure 3.

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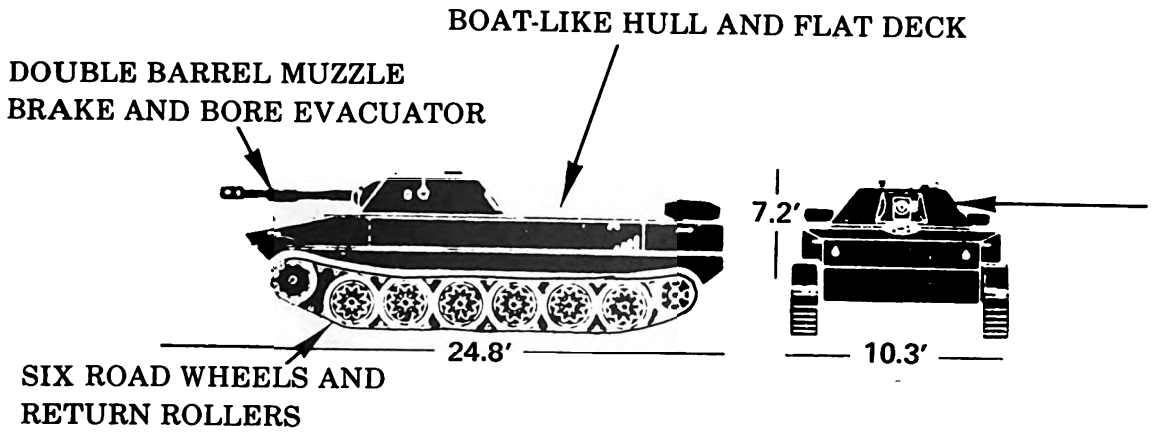
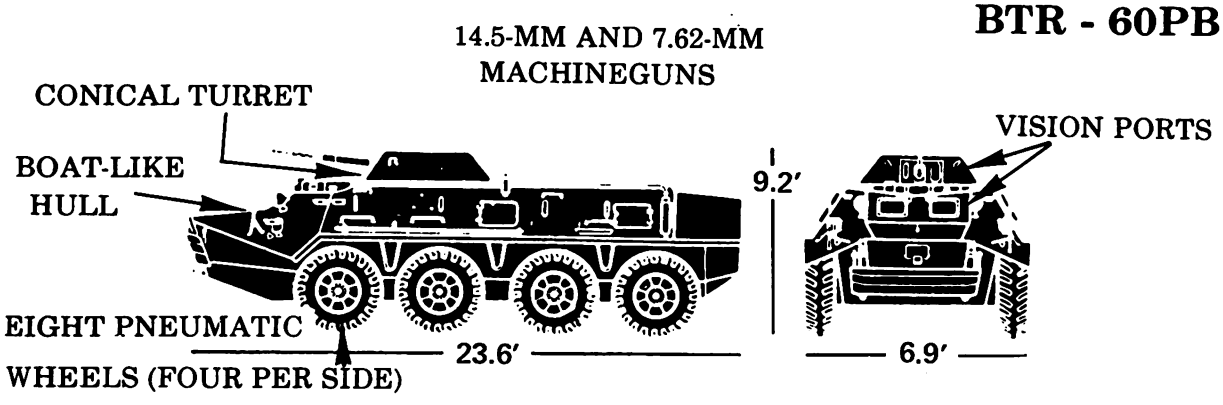
PT 76



TECHNICAL CHARACTERISTICS	ROLE	WHERE ASSIGNED	REMARKS
Crew: 3 Weight: 14 Tons Gun: 76mm Ammunition: APHE, HEAT, HVAP Effective Range: 1,000 meters	Recon	3 per MR & Tanks Regt Recon Co 7 per MR & Tank Div Recon Bn	Amphibious light tank Armor thickness equivalent to APC

Figure 4.

BTR - 60PB



TECHNICAL CHARACTERISTICS	ROLE	WHERE ASSIGNED	REMARKS
Crew: 2 Passengers: 8 Weight: 10 tons Armament: *14.5 hv MG, 7.62 Co-ax* Wheels: 8 Effective range: 14.5-mm Machinegun - 2,000 meters Effective range: 7.62-mm Machinegun - 1,000 meters	Motor rifle troops APC	3 per MR Plt 10 per MR Co 32 per MR Bn	Armor overhead cover and turret.

Figure 5.

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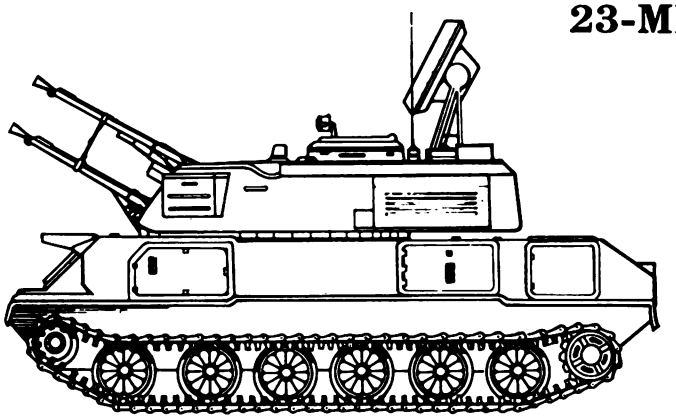
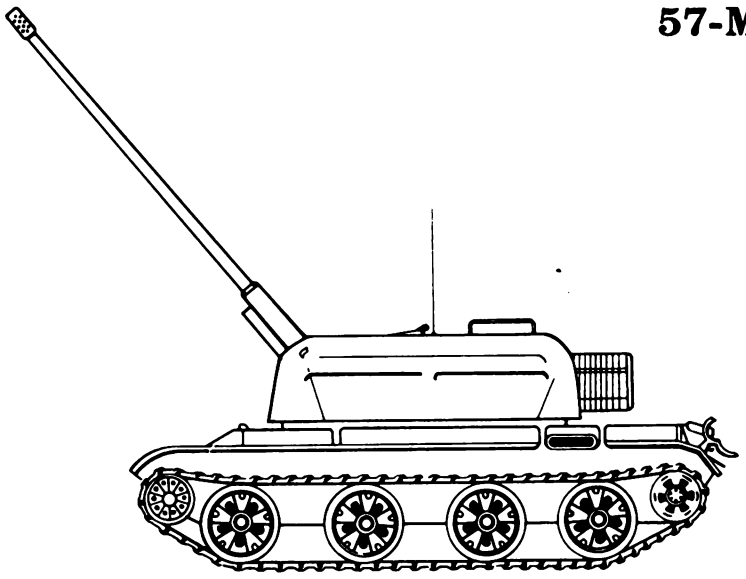
23-MM ZSU-23-4



SLANT RANGE	CYCLIC RATE OF FIRE (RPM)	FIRE CONTROL	NUMBER ASSIGNED	REMARKS
3000 M	4000	Radar Optic	4 per MR and Tk regt AA btry	Self propelled, four barrels

Figure 6.

57-MM ZSU-57-2



SLANT RANGE	CYCLIC RATE OF FIRE (RPM)	FIRE CONTROL	NUMBER ASSIGNED	REMARKS
4000 M	240	Optic	4 per Tk regt AA btry	Self propelled, twin barrel. Still held by some tank regiments.

Figure 7.

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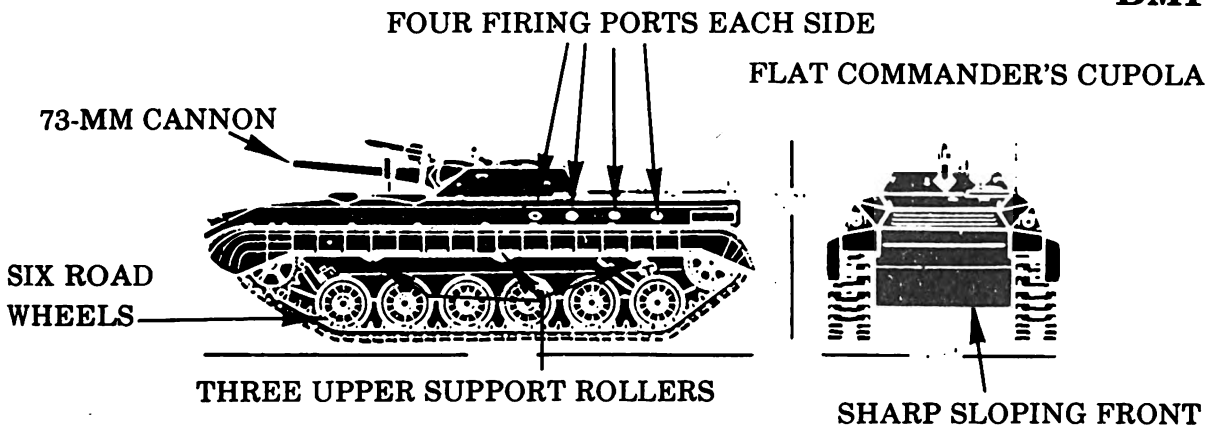
BMP

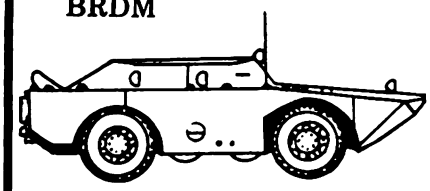
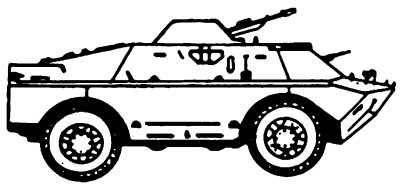
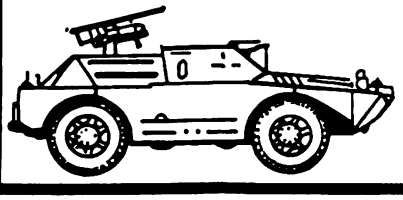


TECHNICAL CHARACTERISTICS	ROLE	WHERE ASSIGNED	REMARKS
Crew: 3 Passengers: 8 Weight: 12.5 tons Armament: 73-mm smooth bore; 7.62 mm co-ax Effective range: 73-mm - 700 meters Some fitted with SAGGER Tracked Speed in water: 8 km/hr	APC	Same as BTR-60PB	SAGGER ATGM optional fit

Figure 8.

3 RECON & ATGM VEHICLES

Figure 9.

	TECH – CHAR	ROLE	NUMBER ASG	REMARKS
BRDM 	CREW: 5 WEIGHT: 6 TONS ARMAMENT: NONE FIXED WHEELS: 4 SPEED IN WATER 10 KM/HOUR	SCOUT CAR	1 PER MR BN HQ 4 PER TK REGT RECON CO 4 PER MR REGT RECON CO 2 PER MR AND TK REGT CHEMICAL DEF PL 21 PER MR AND TK PER MR AND TK	HAS AUXILIARY WHEELS WHICH CAN BE LOWERED FOR OBSTACLE CROSSING.
BRDM-2 	CREW: 3-4 WEIGHT: 7 TONS ARMAMENT: 14.5 HV MG 7.62-mm COAX WHEELS: 4 SPEED IN WATER 10 KM/HOUR			HAS AUXILIARY WHEELS WHICH CAN BE LOWERED FOR OBSTACLE CROSSING.
SAGGER-BRDM 	RANGE: 500-3000M WARHEAD: HEAT GUIDANCE: WIRE 6 SAGGER MISSILES MOUNTED ON BRDM	MR AND DIV ANTI-TANK GUIDED WEAPON	9 PER MR REGT ATGM BTRY 9 MR DIV ATK BN	ONE RPG-7 PER DETACH-FOR CLOSE ANTITANK DEFENSE.

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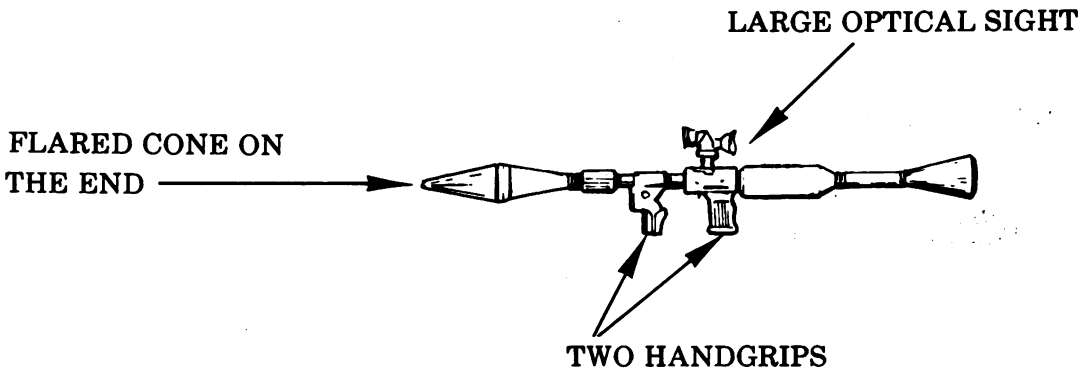

NATO NOMENCLATURE: RPG-7V

Effective range: 500 meters
Ammunition reloadable
Role: Squad antitank weapon

Figure 10.

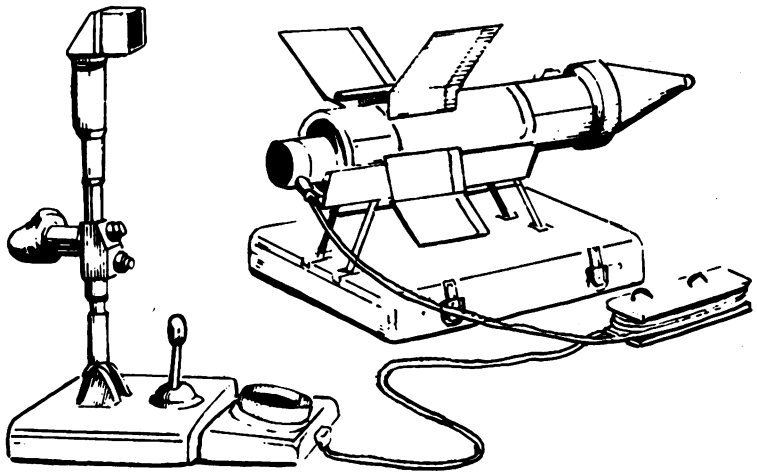

Figure 11.

NATO NOMENCLATURE: Manpacked (suitcase) Sagger

The Sagger is a wire-guided antitank missile with an effective range of 3,000 meters. A three-man team carries the portable launcher, the fire control equipment, and two complete missiles. Gunner normally displaces 15 meters from the missile during firing. In flight identification: look for smoke and flare trail.

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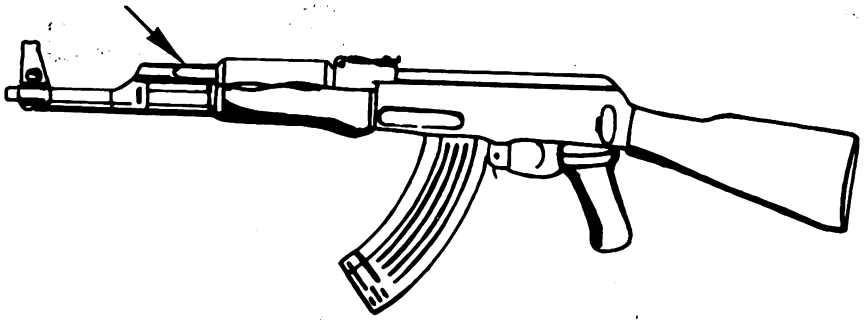
RAISED STOCK GRIP

FOUR SMALL HOLES

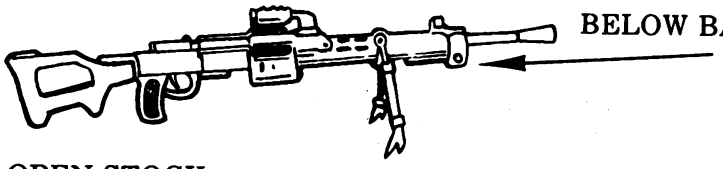


NATO NOMENCLATURE: AK (7.62-mm modernized assault rifle, Kalashnikov)

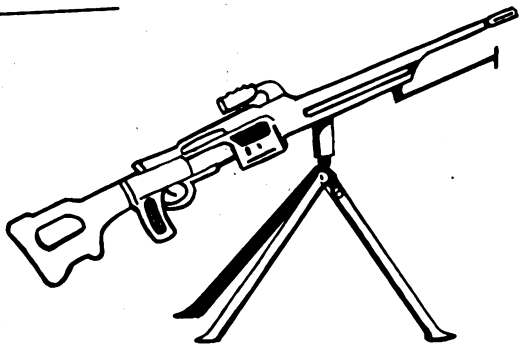
Effective Range: 400 meters
Role: Basic individual weapon; newer versions have folding stock

Figure 12.

GAS CYLINDER BELOW BARREL



OPEN STOCK



PKM IN AA ROLE

NATO NOMENCLATURE:
PKM general purpose machinegun

Effective range: 1,000 meters
Role: Squad or company belt-fed machinegun

Figure 13.

TASK NUMBER: 071-11A-0806

REFERENCES:

TC 7-24, Antiarmor Tactics and Techniques for Mechanized Infantry
TC 30-3, Equipment Recognition Guide, 11 April 1975
TRADOC Bulletin 2 (unclassified), April 1975

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TASK

ENFORCE NOISE, LIGHT, AND LITTER DISCIPLINE.

EVALUATION

CONDITIONS:

As the leader of any combat element conducting any tactical mission (defensive, offensive, etc.) during daylight or the hours of darkness.

STANDARDS:

The element leader will insure that:

1. Noise is kept at a minimum.
2. No light is visible to the enemy.
3. The area is free of litter and other evidence of the element's presence.

TRAINING

1. Noise discipline:

a. Avoid all unnecessary movement. This includes vehicular and foot travel.

b. Metal parts must be taped or otherwise covered to prevent them from making noise when contacting each other. Examples are weapon slings, canteen cups, ID tags, etc. Be careful that moving parts of weapons are not so restricted as to prevent their operation.

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c. Talking must be held to only that level which is necessary to conduct or plan for conduct of operations, including unnecessary radio communications. Radios must not be heard. Wire communications should be used when occupying defensive positions.

2. Light discipline:

a. Allow no smoking except when concealed from all possible enemy view. Smoking should be discouraged at night - SMELL!

b. If flashlights or other lights are used, they must be filtered and concealed, such as underneath a poncho.

c. Cover anything that shines or glares; shiny metal surfaces, vehicles, glass, etc.

d. Use all available natural concealment and camouflage on vehicles, equipment, etc.

3. Litter discipline:

a. Collection points must be established when occupying fixed positions for disposal of used food containers, empty ammo boxes, old camouflage, dirt from defensive position , etc. During movement, all such litter will be carried with the element until such time that it can be disposed of without leaving any trace.

b. Unused equipment must be concealed from enemy view.

TASK NUMBER: 071-11A-0807
REFERENCES:

FM 21-75, Combat Skills of the Soldier
TEC Lesson 935-071-1029-F, Counterintelligence

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TASK
EMPLACE AND RECOVER FIELD-EXPEDIENT WARNING DEVICES.

EVALUATION

CONDITIONS:

In daylight, given:

1. Used C-ration cans, used ammunition boxes, or other discarded metal containers.

2. Used small-arms ammunition, pebbles, or other small, hard objects.

3. A location for a defensive position.

4. Barrier wire, WD-1 communication wire, or similar wire.

5. A suspected route of enemy advance or well-defined avenue of approach.

6. Thirty minutes to complete emplacement.

STANDARDS:

Within time specified, the devices must meet the following specifications:

1. **Security** - Devices must be securely attached to either barrier wire (or WD-1 communication wire, etc. along a known or suspected route of enemy advance.

2. **Concealment** - Devices must not be readily observable by an enemy approaching at night.

3. **Forewarning** - Devices must produce sufficient noise to warn personnel in defensive position of enemy advancing toward their position.

4. **Simplicity** - Devices that could be used by the enemy against you must be easily removable upon leaving defensive position.

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1. Components. Field-expedient warning device are limited only by your imagination. Four basic components are needed.

a. Container (C-ration can, metal ammunition box, or any other metal container without a bright, shiny finish).

b. Noise-maker (pebbles, stones, brass ammunition casings, or any other small, hard objects which, when put in the container, will make a noise when the container is shaken).

c. Trip wire (WD-1, barrier wire, or any similar wire).

d. Attachment device (a small piece of wire, string, cloth, etc., to tie container to trip wire).

2. Construction.

a. Cut holes in the side(s) and bottom of the container (to reduce wind resistance and allow water drainage). If container has a bright, shiny finish, paint it with a subdued color (OD, brown, flat black) or cover it with mud (if only mud is available, consider using a different container).

b. Attach container to trip wire. If a wire barrier is in place, use it; if not, string trip wire across likely avenue of approach at knee level or below. Attach container at a spot where natural vegetation will conceal it from enemy detection.

c. Place noise-making objects in container.

3. Recovery. Recover devices that could be used by the enemy against you before leaving defensive position.

TASK NUMBER: 071-11A-0809
REFERENCES:

None

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TASK
EMPLACE/RECOVER PYROTECHNIC EARLY WARNING DEVICES.

EVALUATION

CONDITIONS:

Given WD-1/TT field wire, one trip flare, M49 or M49A1 (inert) with M3 pull-release firing device, and a designated area for pyrotechnic employment.

STANDARDS:

1. Install trip flare and M3 firing device so that the flare is firmly attached in place with trip wire crossing the designated area.

2. Remove trip flare by disarming the M3 firing device and removing flare from the designated area.

TRAINING

1. Trip flares and M3 firing devices with trip wire are employed extending across any narrow trail approaching from the direction of enemy main forces, allowing for maximum observation of trail from friendly positions. **Typical employment sites should have the following characteristics:**

a. A narrow trail approaches from the direction of enemy main forces; it is about 100 meters from forward positions, and is near the adjacent friendly unit.

b. Two routes in open terrain approach your position directly; each route is about 10-15 meters wide.

c. A narrow wash approaches to within 10-15 meters of a listening post.

d. A narrow trail, approaching from the direction of bypassed enemy.

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2. Installation procedure:

a. Remove protective cap of firing device.

b. Crimp blasting cap (dummy) to base of firing device.

c. Anchor trip flare about 16 inches above ground level and attach firing device with ratchet pointing toward trail; locate flare on enemy side of anchor.

d. Tie a length of field wire (trip wire) to anchor across trail and about 16 inches above ground level; stretch wire to firing device anchor point and cut. Remove insulation to a point about 10 inches from newly cut end.

e. Place end of naked wire through hole in winch and draw wire taut.

f. With knurled knob, draw up trip wire until locking safety pin is pulled into wide portion of safety pin hole; remove locking safety pin and then positive safety pin.

g. Camouflage firing device and trip flare with natural vegetation, without placing pressure on trip wire.

3. Removal procedure: Reverse the steps used in installation.

TASK NUMBER: 071-11A-0810

REFERENCES:

FM 5-15, Field Fortifications
FM 5-25, Explosives and Demolitions
FM 6-140, Field Artillery Organizations
FM 7-10, The Rifle Company, Platoons, and Squads
FM 20-60, Battlefield Illumination
TEC Lesson 952-061-0050-F, Early Warning Devices

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TASK
EMPLACE/RECOVER ELECTRONIC ANTI- INTRUSION DEVICES.

EVALUATION

CONDITIONS:

Given:

1. A PSID sensor; a location for its emplacement; and a detection range setting.

2. An emplaced PSID sensor to recover.

STANDARDS:

1. Emplacement within 8 minutes:

a. Bury geophone in an upright position at least to ground level.

b. Bury 12 to 18 inches of connecting cable.

c. Camouflage transmitter.

d. Set detection range.

e. Call supervisor to check PSID to insure that it is activating.

2. Recovery within 5 minutes:

a. Turn off transmitter.

b. Dig up connecting cable and geophone without damaging connecting cable and geophone.

c. Wrap antenna and connecting cable around detector unit.

d. Clip geophone to detector unit.

e. Affix plastic clip over antenna and connecting cable insuring that the antenna and connecting cable are secured to the detector unit.

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The basic elements of a PSID sensor are identified in figure 1.

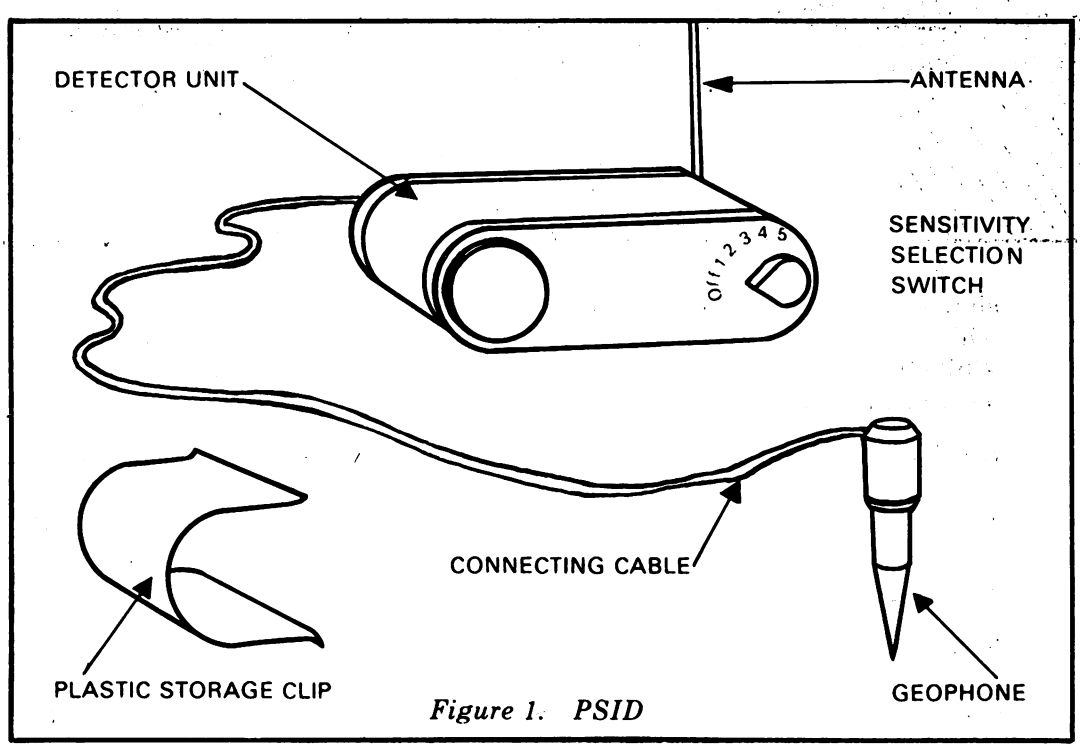

Figure 1. PSID

1. Emplacement Criteria (refer to figure 2):

The PSID sensor is hand-emplaced. For the PSID to operate properly, emplacement personnel must insure that:

a. Geophone is positioned spike down and in an upright position as shown in figure 2. If tilt is too great, the geophone will not trigger the detector unit's transmitter. The geophone should be buried at least to ground level. Push the geophone down into the ground, by hand or by **stepping** (not stamping) on it. If necessary, loosen the ground with an intrenching tool before attempting to force the geophone into the ground. DO NOT drive the geophone into the ground with a hard object, such as a rock, rifle butt, or steel helmet.

b. Twelve to 18 inches of the connecting cable is buried along with the geophone as shown in figure 2. By burying a short distance of the cable, the possibility of activation signals being triggered by a moving geophone cable is reduced.

c. The detector unit is positioned above ground. The antenna should NOT be in contact with any wet foliage which might ground the antenna. When the detector unit is employed during daylight hours, dry twigs and weeds should be used for camouflage. At night, the size and shape of the detector unit minimizes the requirements for camouflage.

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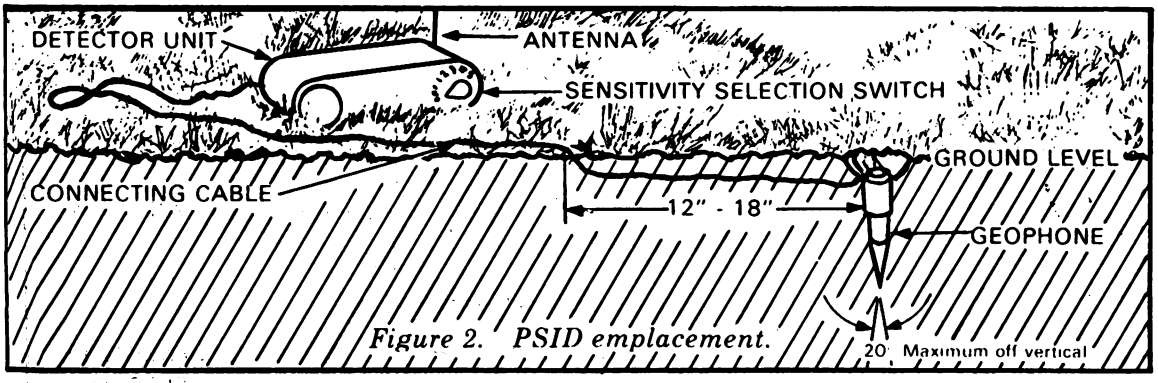

Figure 2. PSID emplacement.

d. Once the detector unit is emplaced, the desired detection range should be set. Each detector is equipped with an on-off switch (figure 1) which enables the detection zone to be adjusted by emplacement personnel. While these distances vary with soil conditions, the sensitivity settings are designed for the following:

SWITCH POSITION	DETECTION RANGE (in meters)
1	1
2	2
3	3
4	6
5	15

2. Recovery:

a. Locate the detector unit and turn the sensitivity selection switch to the off position. Locate the geophone and dislodge it from its location and also remove the connecting cable. DO NOT remove the geophone by pulling on the connecting cable.

b. Once the detector has been recovered, wrap the antenna around the detector unit, then wrap the connecting cable around the detector unit and clip the geophone into the holder on the transmitter. Affix the plastic clip over the wire and antenna as shown in figure 3.

TASK NUMBER: 071-11A-0811
REFERENCE:
TM 5-6350-249-14, AN/GSQ-151, Alarm Set, Anti-Intrusion Restricted Area, (PSID)

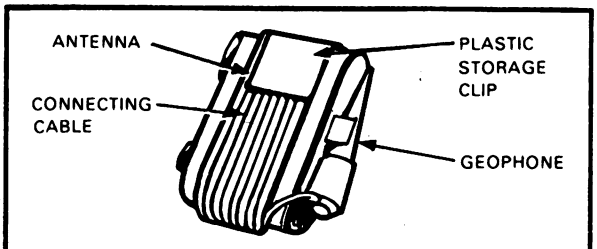

Figure 3. PSID in storage.

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TASK
DETERMINE DISTANCE WHILE MOVING BETWEEN TWO POINTS ON THE GROUND.

EVALUATION

CONDITIONS:

Moving dismounted over varying types of terrain, during daylight hours, in all types of weather, given a 600-meter pace course and pace factor conversion table, a start point and finish point not less than 500 meters nor greater than 700 meters in length.

STANDARD:

Determine the distance between the start point and finish point to within 5% of the actual distance in a maximum of 45 minutes.

TRAINING

1. If soldier does not already know his pace count, he will count each step from the start to the finish point of the 600-meter pace course and use the pace factor conversion table to determine his pace for 100 meters.
2. To keep track of the distance between two unknown points, you can:
   a. Tie a knot in a string every 100 meters.
   b. Move objects from one pocket to another every 100 meters.
   c. Make marks on a piece of paper, etc., every 100 meters.

TASK NUMBER: 071-11A-1007
REFERENCES:

FM 21-26, Map Reading
TEC Lesson 930-071-0018-F, Land Navigation with Map and Compass

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TASK

DETERMINE A MAGNETIC AZIMUTH BETWEEN TWO KNOWN POINTS ON THE GROUND

EVALUATION

CONDITIONS:

Given a lensatic compass (which has been checked against an aiming circle and has no noticeable deviation), in a field environment, under daylight conditions.

STANDARD:

Within 1 minute, determine any magnetic azimuth to within 3 degrees.

TRAINING

1. Fully open the compass so that the cover forms a straight edge with the base.

2. Move the eyepiece to its rearmost position.

3. Place the thumb of either hand through the thumb loop of the compass and extend the index finger of the same hand along the side of the compass.

4. Place the thumb of the other hand between the eyepiece and the bezel ring and extend the index finger along the side of the compass.

5. Interlock the fingers of both hands underneath the compass to form a stable platform.

6. Pull the elbows firmly into the sides of the body. This will place the compass between the chin and the belt.

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7. Standing at a known point, rotate the body and compass until the body and the cover of the compass point toward the object to which the magnetic azimuth is to be determined.

8. Look at the floating dial of the compass and read the magnetic azimuth from beneath the fixed black index line.

TASK NUMBER: 071-11A-1003

REFERENCES:

FM 21-26, Map Reading
TC 7-5, Land Navigation
TEC 930-071-0014-F, The Lensatic Compass

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TRAINING AND EVALUATION OUTLINE

TASK
DETERMINE A GRID AZIMUTH BETWEEN TWO GIVEN POINTS ON A MAP.

EVALUATION

CONDITIONS:

Given a standard 1:50,000 scale topographic map, coordinates scale and protractor, a straight edge, a pencil and requirement to determine the azimuth from one designated point (A) to another point (B) on the map.

STANDARD:

Determine the grid azimuth from point A to point B to within 3 degrees in 3 minutes.

TRAINING

1. Locate point A and point B (see figure 1).

2. Draw a straight line from point A to point B.

3. Place the index of the protractor over center of mass of point A with the 0° on the protractor at the top and 90° to the right. The base line of the protractor must be parallel to the nearest north/south grid line.

4. Start at the 0° point on the protractor and read to the right in a clockwise manner until reaching the point where the straight line intersects the protractor scale.

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5. Read the azimuth from the protractor.

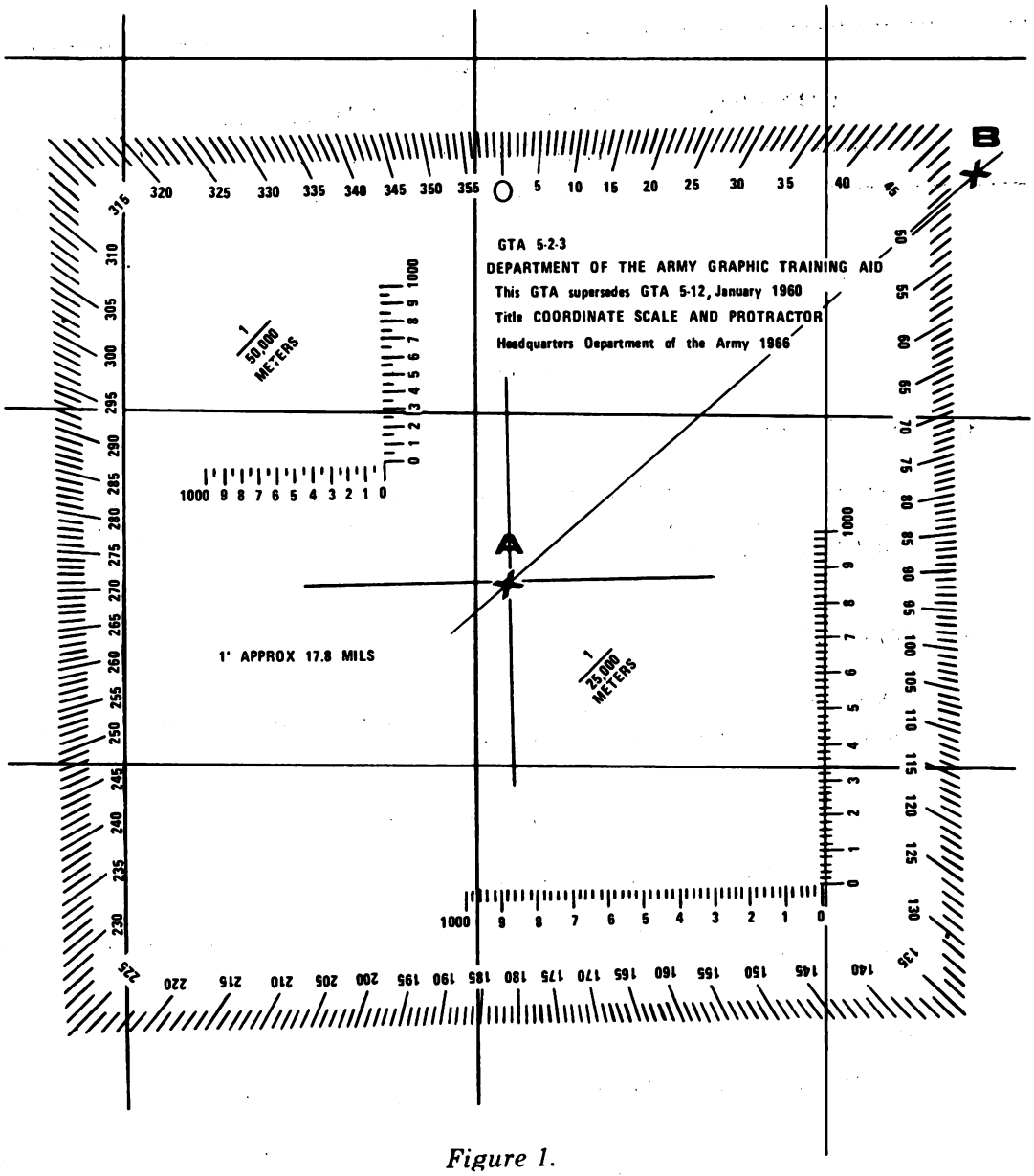

Figure 1.

TASK NUMBER: 071-11A-1010

REFERENCES:

FM 21-26, Map Reading
TEC Lesson 930-071-0014-F, Measuring Distance and Azimuth

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TRAINING AND EVALUATION OUTLINE

TASK

CONVERT A MAGNETIC AZIMUTH TO A GRID AZIMUTH (OR GRID AZIMUTH TO MAGNETIC AZIMUTH).

EVALUATION

CONDITIONS:

Given a standard 1:50,000 scale topographic map with a declination diagram, a pencil, and either a magnetic azimuth or a grid azimuth which must be converted.

STANDARD:

Within 3 minutes, convert the given magnetic azimuth to a grid azimuth (or grid to magnetic) without error.

TRAINING

1. Easterly Grid Magnetic (GM) Angle (figure 1):

a. To convert a magnetic azimuth to a grid azimuth, add the value of the GM angle to the magnetic azimuth.

b. To convert a grid azimuth to a magnetic azimuth, subtract the GM angle from the grid azimuth.

2. Westerly Grid Magnetic (GM) Angle (figure 2):

a. To convert a magnetic azimuth to a grid azimuth, subtract the value of the GM angle from the magnetic azimuth.

b. To convert a grid azimuth to a magnetic azimuth, add the value of the GM angle to the grid azimuth.

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EASTERLY GM ANGLE

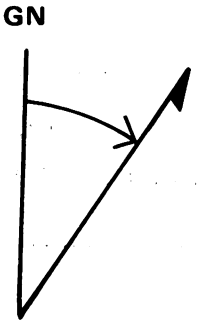

Figure 1.

WESTERLY GM ANGLE

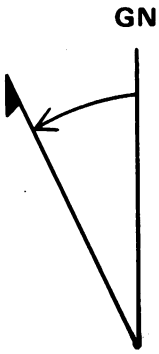

Figure 2.

TASK NUMBER: 071-11A-1009
REFERENCES:

FM 21-26, Map Reading
TEC lesson 930-071-0015-F, Converting Azimuths

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TRAINING AND EVALUATION OUTLINE

TASK

MEASURE A GROUND DISTANCE ON A MAP.

EVALUATION

CONDITIONS:

Given:

1. A standard 1:50,000 topographic map on which is plotted:

   a. Point A and point B, 3,000 to 4,000 meters apart.

   b. Point C and point D, 3,000 to 4,000 meters apart, on a road (trail) which changes direction at least twice.

2. A strip of paper with a straight edge.

STANDARDS:

1. Determine the straight-line distance, in meters, from point A to point B within 50 meters, in 3 minutes.

2. Determine the road (curved-line) distance from point C to point D within 100 meters, in 3 minutes.

TRAINING

1. Refer to figure 1:

a. Lay the strip of paper on the map so that it touches point A and point B.

b. Make a tick mark on the strip of paper at point A and point B.

c. Lay the strip of paper on the meter graphic scale of the map so that the tick mark for point B is on one of the 1,000-meter division marks on the scale and the tick mark for point A is on or between one of the 100-meter division marks of the extension scale.

d. Read the distance, in meters, between the tick mark for point A and tick mark for point B.

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2. **Refer to figure 2:**

a. Make a tick mark near one end of the strip of paper.

b. Lay the strip of paper on the map with this tick mark at point C and aline the edge of the strip of paper with the road.

c. At the point at which the road turns, make a tick mark on the strip of paper and on the map.

d. Keeping the tick marks together, pivot the strip of paper until it is again alined with the road.

e. At the point at which the road turns, make a tick mark on the strip of paper and on the map.

f. Continue this procedure until you reach point D.

g. Lay the strip of paper on the meter graphic scale of the map so that the tick mark for point B is on one of the 1,000-meter division marks of the scale and tick mark for point A is on or between one of the 100-meter division marks of the extension scale.

h. Read the distance, in meters, between the tick mark for point A and the tick mark for point B.

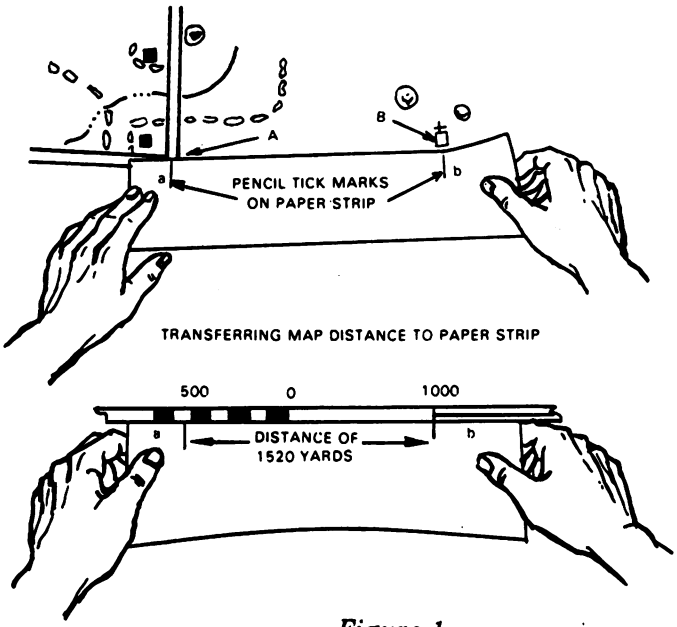

Figure 1.

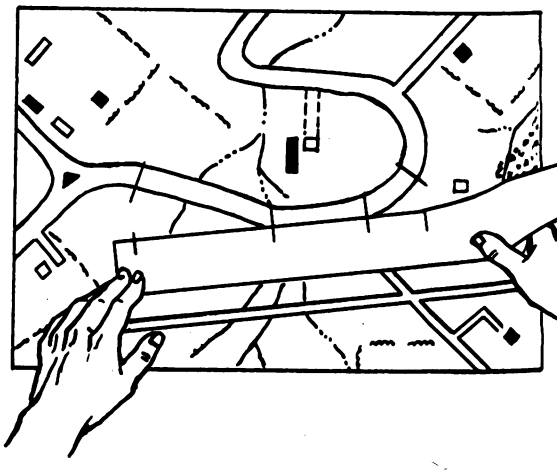

Figure 2.

TASK NUMBER: 071-11A-1008
REFERENCES:

FM 21-26, Map Reading
TC 7-5, Land Navigation

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TRAINING AND EVALUATION OUTLINE

TASK

DETERMINE A LOCATION ON THE GROUND.

EVALUATION

CONDITIONS:

While at an unknown location on the ground, given a 1:50,000 scale military map of the area, a coordinate scale and protractor, and a requirement to determine the six-digit map coordinates of the location.

STANDARD:

Within 15 minutes, determine the coordinates to within 100 meters of the actual location.

TRAINING

1. Put the map away.
2. Determine the four cardinal directions (north, south, east, and west) by using the lensatic compass.
3. Determine the type of terrain features on which you are located.
4. Determine what types of terrain features surround the location.
5. Orient the map using the lensatic compass.
6. Relate the terrain features on the ground to those shown on the map.
7. Having determined where the terrain features on the ground and those on the map coincide, determine the coordinate location of that point using the coordinate scale and protractor.

TASK NUMBER: 071-11A-1005

REFERENCES:

FM 21-26, Map Reading

TEC Lesson 930-071-0018-F, Land Navigation with a Map and Compass

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TRAINING AND EVALUATION OUTLINE

TASK

NAVIGATE FROM ONE POSITION ON THE GROUND TO ANOTHER POINT.

EVALUATION

CONDITIONS:

Given a standard 1:50,000 scale topographic map, lensatic compass, a coordinate scale, protractor, a designated start and finish point no more than 3,000 meters apart. The field location of the task should appear on the topographic map and contain varying types of terrain. Weather conditions should not be considered a limiting factor.

STANDARD:

Within 1 hour, move from the start point to the finish point.

TRAINING

1. Locate the start point and finish point on the map and determine where the start point is on the ground.

2. Determine the grid azimuth from the start point to the finish point on the map.

3. Convert the grid azimuth to a magnetic azimuth.

4. Determine the distance between the start point and the finish point on the map.

5. Convert the map distance to pace count.

6. Place the azimuth between the start point and the finish point under the fixed black index line of the lensatic compass.

7. When planning the route between points, select terrain features that will be encountered by making a map reconnaissance.

8. Make mental checklist of such features.

9. Move to the start point to begin pace count.

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10. While moving along the route, check against your "list."

11. After reaching the finish point, conduct a detailed terrain analysis to confirm your location.

TASK NUMBER: 071-11A-1006

REFERENCES:

FM 21-26, Map Reading
TEC Lesson 930-071-0018-F, Land Navigation with Map and Compass

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TRAINING AND EVALUATION OUTLINE

TASK

CALL FOR AND ADJUST COORDINATED HIGH EXPLOSIVE AND ILLUMINATION MISSION.

EVALUATION

CONDITIONS:

As a forward observer in a field environment at night, given a 1: 50,000 map, overlay with company targets, M2 compass, binoculars, radio, call signs, and a designated area target.

STANDARDS:

1. Initial request for fire must be made within 2 minutes after target has been designated, subsequent corrections will be made within 30 seconds after the round lands, illumination will be adjusted so that flare burns out as it touches ground and is within 200 meters of target, and HE will be adjusted until a 100-meter bracket is split.

2. Proper control will be exercised in the coordination of both HE and illumination.

TRAINING

1. Adjustment of Ilumination.

a. Range and deviation are adjusted by using standard observed fire procedures. Because of large area illuminated, adjustment is considered complete when within 200 meters of target.

b. Correct height of burst (HOB) should allow flare to hit the ground as the flare burns out. Changes in HOB are made only in multiples of 50 meters

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(fractions of 50 meters are rounded up). When HOB is too high, correction is made from height of flare when it burned out. If HOB is too low, count the number of seconds flare burned on the ground and then multiply that by the rate of descent of the type of flare fired.

2. Conducting a Coordinated Illumination Mission.

a. Call for fire should follow standard format with "at my command" as the method of control.

b. Example: FO: HOTEL 40, THIS IS HOTEL 42; ADJUST FIRE, OVER
FDC: HOTEL 42, THIS IS HOTEL 40; ADJUST FIRE, OUT
FO: GRID 891256; SUSPECTED STALLED VEHICLE; ILLUMINATION AND HE AT MY COMMAND, OVER
FDC: GRID 891256 SUSPECTED STALLED VEHICLE; ILLUMINATION AND HE AT YOUR COMMAND, OUT
FDC: ILLUMINATION AND HE READY, OVER
FO: FIRE ILLUMINATION, OVER
FDC: FIRE ILLUMINATION, OUT
FDC: SHOT, OVER
FO: SHOT, OUT
FO: FIRE HE, OVER
FDC: FIRE HE, OUT
FDC: SHOT, OVER
FO: SHOT. OUT

After rounds land:

FO: DIRECTION 1590 ILLUMINATION UP 150, ADD 200; HE LEFT 400, DROP 400, OVER
FDC: DIRECTION 1590 ILLUMINATION UP 150, ADD 200; HE LEFT 400, DROP 400
FDC: ILLUMINATION AND HE READY, OVER
FO: FIRE ILLUMINATION, OVER
FDC: FIRE ILLUMINATION, OUT
FDC: SHOT, OVER
FO: SHOT, OUT
FO: FIRE HE, OVER
FDC: FIRE HE, OUT
FDC: SHOT, OVER
FO: SHOT, OUT

After rounds land:

FO: REPEAT ILLUMINATION; HE ADD 200, OVER
FDC: REPEAT ILLUMINATION; HE ADD 200, OUT
FDC: ILLUMINATION AND HE READY, OVER
FO: FIRE ILLUMINATION, OVER
FDC: FIRE ILLUMINATION, OUT
FDC: SHOT, OVER
FO: SHOT, OUT
FO: FIRE HE, OVER
FDC: FIRE HE, OUT
FDC: SHOT, OVER
FO: SHOT, OUT

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After rounds land on target:

FO: CONTINUOUS ILLUMINATION, OVER
FDC: CONTINUOUS ILLUMINATION, OUT
FDC: SHOT, OVER
FO: SHOT, OUT

FO waits for target to be adequately illuminated:

FO: FIRE FOR EFFECT, OVER
FDC: FIRE FOR EFFECT, OUT

After target is destroyed:

FO: END OF MISSION, ENEMY VEHICLE DESTROYED, OUT

TASK NUMBER: 071-11C-1503

REFERENCE:

FM 23-91, Mortar Gunnery

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TASK

CALL FOR/ADJUST A SCREENING MISSION.

EVALUATION

CONDITIONS:

As a forward observer, given a 1:50,000 map, overlay with company targets, M2 compass, binoculars, a radio, call signs, a designated observable screen location, and screening time.

STANDARDS:

1. Initial call for screen must be made within 2 minutes after screen location has been designated.

2. Initial adjustments will be made with HE; WP will be used to confirm adjustment of last HE round.

3. Adjustments must be transmitted within 20 seconds after round impacts.

4. Sheaf must be opened with a subsequent correction from previous adjustment and according to wind direction.

5. Screen will be established and proper control factor determined prior to maintenance phase.

6. FO must maintain screen for the required amount of time.

TRAINING

1. The call for fire follows the standard call-for-fire format with the screening mission indicated in the fifth element.

2. For rapid adjustments in deviation, the FO may use corrections by turns. Using the formula FXS/10 = T:

$$F = \text{the factor } \frac{\text{OT distance}}{\text{GT range}}$$

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S = FO's spotting in mils,

10 is the number of mils in one turn of traversing handwheel, and

T is the number of turns required (to nearest half turn). T is relayed directly from the FO to the mortars by the FDC.

3. Steps in a screening mission:

a. **Adjustment.** Select the adjusting mortar and adjusting point based on the direction of the wind and terrain in the target area. The FO picks his initial adjusting point based on the wind direction in the target area. He will choose his final adjusting point on the upwind side and use the upwind mortar for adjustment. The adjustment is begun with HE ammunition using normal procedure. The last round fired in adjustment is WP.

b. **Opening the Sheaf.** After the adjustment, the FO sends a subsequent correction to open the sheaf. As a guide, the FO opens the sheaf three-fourths of the distance to be screened for a flanking or quartering wind. For a headwind or a tailwind, the parallel sheaf is used.

Example: The wind is from the flank at 3 o'clock. The area to be screened is 600 meters wide. The adjusting point is short and right of the enemy position. The last round (WP) in the adjustment has been fired. To determine the amount the sheaf should be opened, the FO multiplies the total distance to be screened (600 meters 107-mm) by ¾ (300 meters 2/3 for 81-mm mortar): ¾ x 600 = 450 meters. The subsequent correction to open the sheaf is OPEN LEFT 450, SECTION LEFT. SECTION LEFT is used so that the smoke of one round will not obscure the burst of another round. The FO determines the number of mils equal to 150 meters (the interval between bursts) and picks points on the ground where each burst should occur. If the rounds do not impact on or near the selected points, he makes corrections.

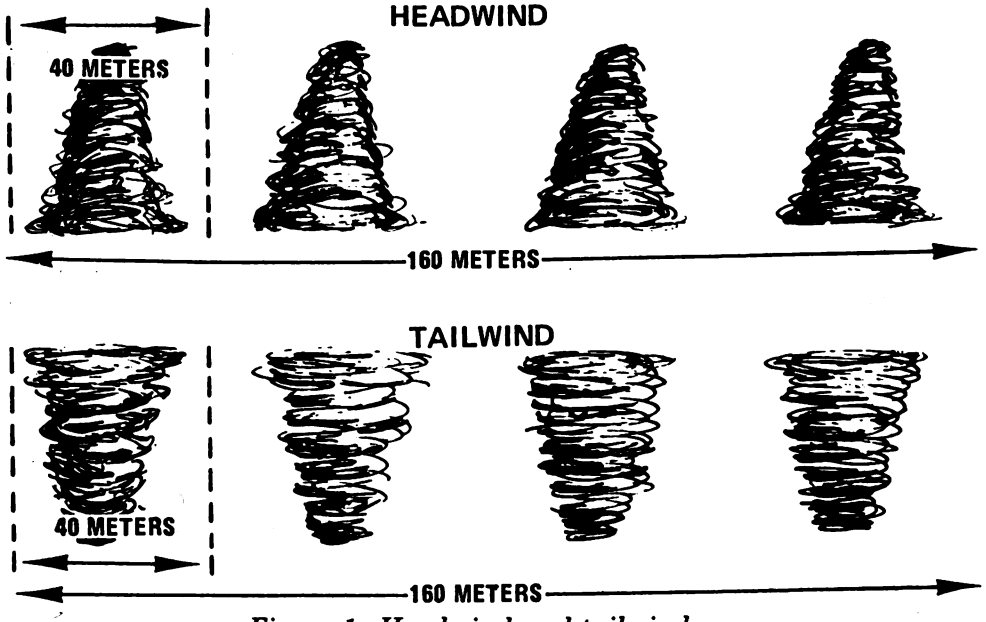

Figure 1. Headwind and tailwind.

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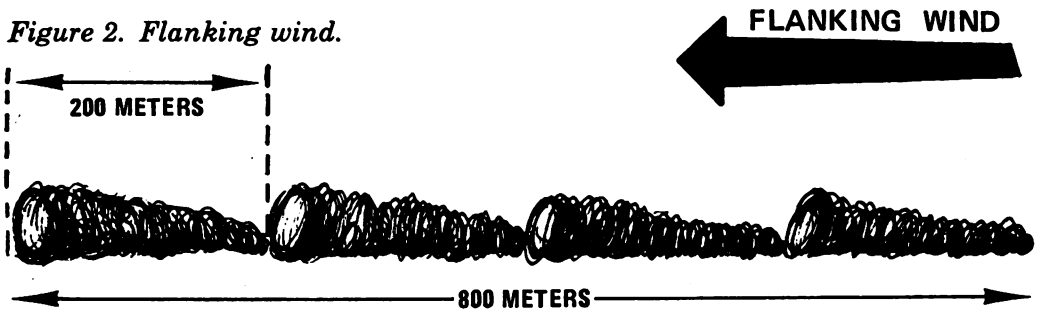
Figure 2. Flanking wind.



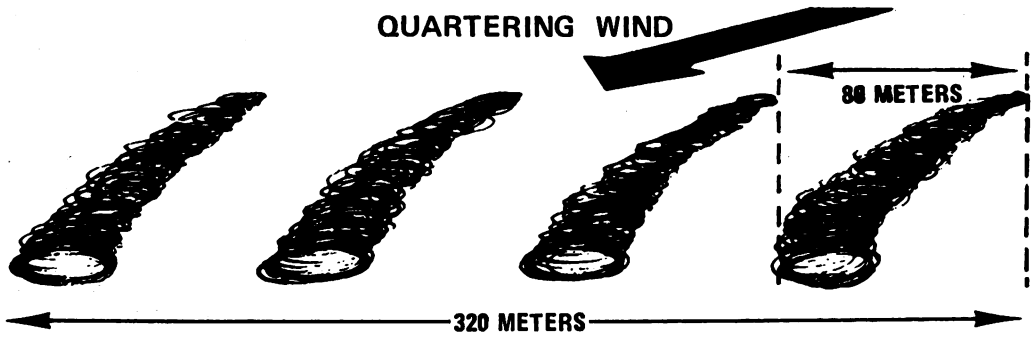


Figure 3. Quartering wind.

c. **Establishing the Screen (Fire for Effect).** After the screen is adjusted or a small correction is made, the FO requests FIRE FOR EFFECT. If the initial fire for effect does not establish the screen, the FO may repeat fire for effect or make correction and repeat fire for effect. He must insure that the screen is established before entering the next step. During the establishment phase of the smokescreen, the FO must determine the control factors he will use during the maintenance phase. He then sends his method of control to the FDC; e.g., CONTINUOUS FIRE FROM THE RIGHT (LEFT).

d. **Maintaining the Screen.**

(1) **With a headwind or tailwind** (perpendicular to the area to be screened). The range center of impact is placed about 500 meters short of the target for a tailwind and about 100 meters over the target for a headwind. After the establishment phase, the FO should request CONTINUOUS FIRE RIGHT (LEFT) to start the maintenance phase, and should control the firing as in a flanking wind (figure 1).

(2) **With a flanking wind** (parallel to the front to be screened). The rounds are placed far enough upwind from the target so that when the wind spreads the smoke, a heavy concentration will settle over that flank. It may be necessary to place the heaviest concentration upwind and small concentrations at intervals on the downwind part of the target. Increase or decrease the rate of fire as necessary. If one flank of the screen thins out, increase the rate of fire on that flank. Corrections for rate of fire or deviation may be necessary for single mortars or the entire section (figure 2).

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Example: NUMBER ONE, DOUBLE RATE OF FIRE, RIGHT TWO TURNS, or SECTION DOUBLE RATE OF FIRE, LEFT THREE TURNS.

(3) **With a quartering wind** (oblique to the front to be screened). The line of impact is to the upwind flank. The range center of impact is about 500 meters upwind of the target for a quartering tailwind or 100 meters upwind ofthe target for a quartering headwind. The FO should request SECTION RIGHT (LEFT) to start the maintenance phase and should control the firing as in a flanking wind (figure 3).

TASK NUMBER: 071-11C-1504

REFERENCE:

FM 23-91, Mortar Gunnery

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TRAINING AND EVALUATION OUTLINE

TASK

DETERMINE VERTICAL SHIFT TO ADJUST INDIRECT FIRE.

EVALUATION

CONDITIONS:

As a forward observer in a field environment, given an M2 compass, registration point (RP), and a target with elevation different from the observation point and RP.

STANDARD:

Within 5 minutes, determine the vertical shift between the RP or observation point and the target to within 10 meters.

TRAINING

1. USING KNOWN REFERENCE POINT.

Vertical Shift. When the shift from a known point method is used, a vertical shift must be made if there is an obvious difference between elevation of the known point and the target. The vertical shift may be computed with an angle-measuring instrument (M2 compass, aiming circle). Use the following procedure to compute a vertical shift: measure the vertical angle to the known point; knowing the distance from the OP to the known point, and using the mil-relation formula, determine the vertical interval at the known point; compute the vertical interval between the OP and the target; then by comparing the known point vertical interval to the target vertical interval, determine the vertical change (up or down) from the known point to the target.

Example: (figure 1) The FO measures a vertical angle of minus 10 mils, to a target at a distance of 2,500 meters. The distance and the vertical angle from the OP to the known point (RP) are 1,500 meters and minus 20 mils, respectively. In the formula W = Rm, let W represent the vertical interval, m represent the measured angle in mils, and R represent the distance to the target in thousands of meters. Therefore, W = -10 x 2.5 = -25 meters of vertical interval between the OP and the target. When the same procedure is used, the vertical interval between the OP and the known point (RP) is - 30 m (W = -20 x 1.5 = -30). A comparison of results shows the target to be 5 mils above the known point. Thus, the vertical shift would be announced as UP 5.

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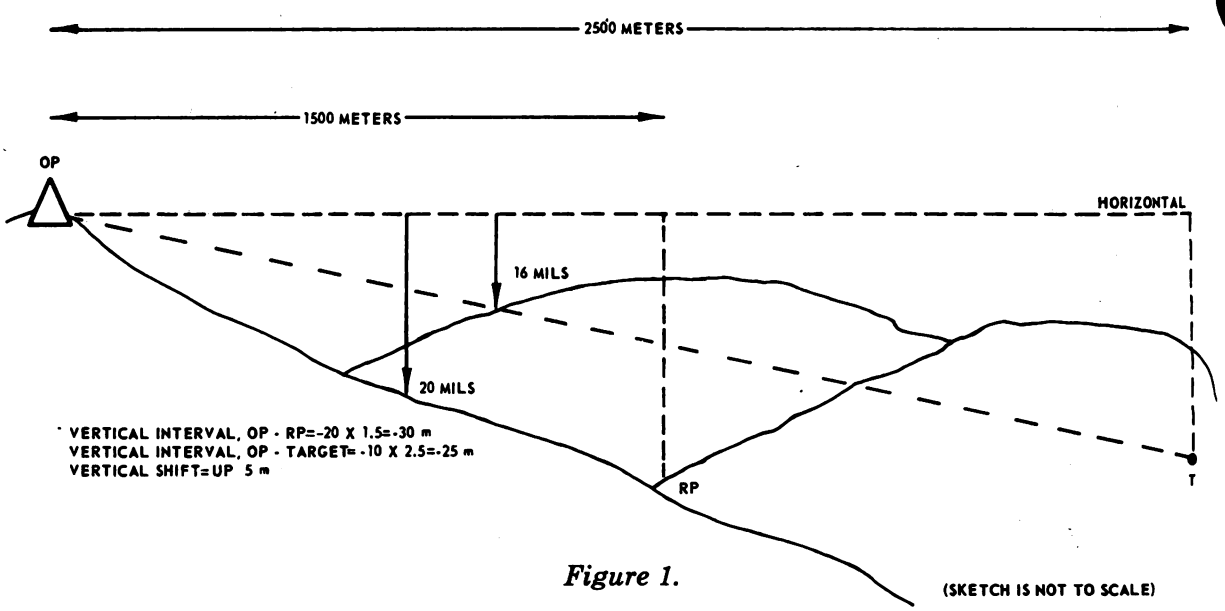

Figure 1.

Example: (figure 1) The FO measures a vertical angle of minus 5 mils to a target at a distance of 2,500 meters. The distance and the vertical angle from the OP to the known point (RP), are 3,000 meters and plus 20 mils, respectively. In the formula W = Rm, let W represent the vertical interval, m represent the measured angle in mils, and R represent the distance to the target (known point) in thousands of meters. Therefore, W = -5 x 2.5 = 12.5 m of vertical interval between the OP (horizontal) and the target. When the same procedure is used, the vertical interval between the OP (horizontal) and the known point (RP) is + 60 meters (W = +20 x 3 = +60). A comparison of results shows the target to be 72.5 m below the known point (RP). Thus, the vertical shift would be announced as DOWN 75.

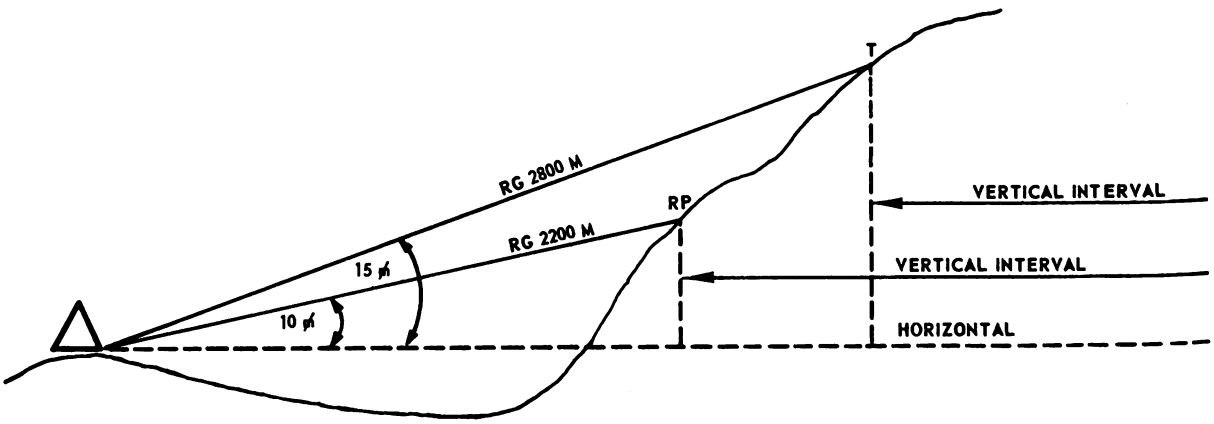

Figure 2. Reference point and target above horizontal.

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Example: (figure 2) The FO measures a vertical angle of plus 15 mils to a target at a distance of 2,800 meters. The distance and the vertical angle from the OP to the knonw point (RP) are 2,200 and a plus 10 mils, respectively. In the formula W = Rm, let W represent the vertical interval, m represent the measured angle in mils, and R represent the distance to the target in thousands of meters. Therefore, W = +15 x 2.8 = +42 meters of vertical interval between the OP and the target. When the same procedure is used, the vertical interval between the OP and the known point (RP) is +27m (W = 10 x 2.2 = +22). A comparison of results shows the target to be 20 m above the known point (RP). Thus, the vertical shift would be announced as UP 20.

2. USING POLAR COORDINATES.

A vertical shift must be made if there is an obvious difference in altitude between the FO and the target. The FO, using an aiming circle or M2 compass, measures the vertical angle to the target. This vertical angle is measured from the horizontal plane through the FO's location to the target. Substituting the measured vertical angle and the estimated distance to the target from m and R, respectively, in the mil-relation formula, the FO computes the vertical shift.

Example: The FO measures the vertical angle to the target of +20m. The estimated distance to the target from the OP is 2,000m. According to the mil relation, $20 = \frac{W}{2.0}$, W= 40m. A vertical shift would then be included as follows: DIRECTION 1000, DISTANCE 2000, UP 40 (figure 3).

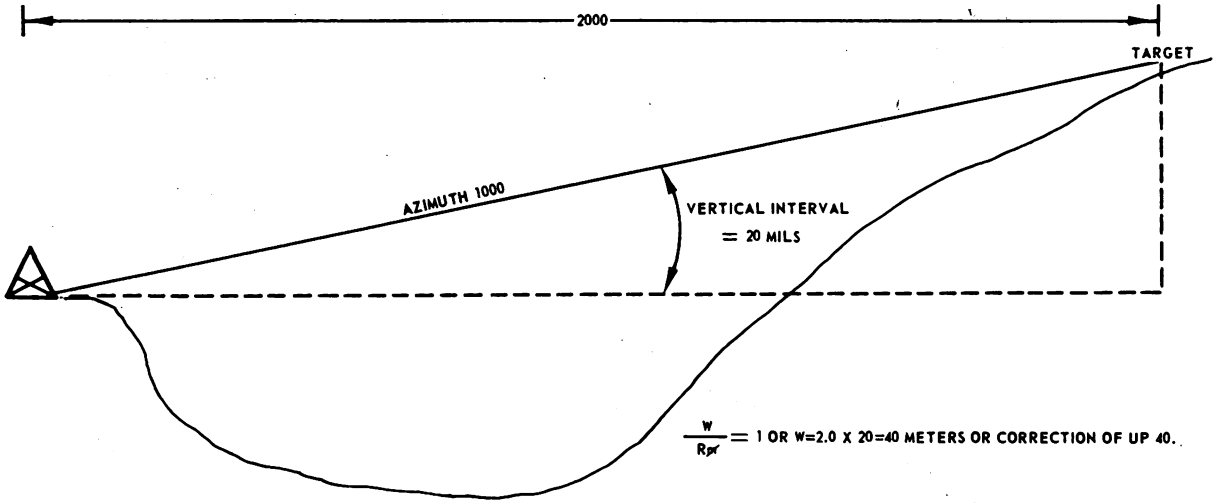

Figure 3. Polar coordinates vertical shift.

TASK NUMBER: 071-11C-1505

REFERENCE:

FM 23-91, Mortar Gunnery

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TRAINING AND EVALUATION OUTLINE

TASK
ASSIST UNIT COMMANDERS IN THE PREPARATION OF FIRE SUPPORT PLAN.

EVALUATION

CONDITIONS:

As a forward observer, given a 1:50,000 map with overlay, and guidance from the unit commander to include: location of forward units, scheme of maneuver, known enemy location, avenues of approach and assembly areas, fires desired, location of mortar and artillery FPFs, and the location of the command post.

STANDARDS:

Be able to make recommendations to aid in preparation of fire support plan by completing a target list, to include target description and location.

TRAINING

1. A forward observer will assist in the preparation of fire support plans by making target recommendations to aid the unit commander in carrying out his planned operations.

2. Considerations for planned targets include known and suspected enemy locations and prominent or key terrain features.

a. Known enemy locations: Plan fires on all known enemy locations which could hinder the supported unit's mission. Plan without regard to boundaries or weapon capabilities.

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FO TARGET LIST

LN NO	TARGET NUMBER	DESCRIPTION	LOCATION	REMARKS
1		FPF	15508330	
2		Defensive Target	15802424	
3		Defensive Target	15278336	
4		Defensive Target	15368319	
5		Hilltop	14848250	
6		Hilltop	15038196	
7		Road Junction	15248171	
8		Ridge	15118081	
9		Enemy Mortar Position	152802	100 M Zone

NOTE: Duplication of effort will be resolved by the next higher headquarters.

b. Suspected enemy locations: This category includes such areas as probable OPs, troop positions, assembly areas, avenues of approach, and routes of withdrawal. These targets are planned so they will be readily available if the target is confirmed.

c. Prominent or key terrain features: This would include hilltops, road junctions, buildings, objectives, and other locations easily identified on a map and the ground. These targets are planned to deny their use to the enemy, aid friendly forces in their capture, and provide reference points from which to shift fires.

3. Targets are planned before, beyond, and on the objective in the offense. In the defense, targets are planned as long-range fires, close defensive fire, final protective fires (FPF), and fires within the battle area.

4. The FO will consolidate his targets on a target list giving a description and location for each target. This list is submitted to the company mortar platoon leader to be incorporated into the unit fire support plan.

TASK NUMBER: 071-11C-1506

REFERENCE:

FM 23-91, Mortar Gunnery

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TASK
LOCATE A POINT ON THE GROUND USING THE POLAR COORDINATE METHOD.

EVALUATION

CONDITIONS:

As a forward observer, given a 1:50,000 map, M2 compass declinated for grid azimuth, and observable target.

STANDARDS:

Using polar coordinate method, locate target to within 10 mils for direction and 100 meters (per 1,000 meters) for range.

TRAINING

1. Polar coordinates consist of the direction and distance from the observer to the target. The observer's location must be known to the FDC to be used in a fire mission.

2. FO's location (to eight digits) is determined using terrain association, resection, or other map reading techniques. (See task: Determine a location on the ground.)

3. Range to the target is determined by use of a map, photomap, or aerial photograph, or is estimated. (See task: Estimate range.)

4. Direction to the target is determined in mils by use of the M2 compass. (See task: Determine an azimuth using an M2 compass.)

TASK NUMBER: 071-11C-1507

REFERENCES:

FM 21-26, Map Reading
FM 23-91, Mortar Gunnery

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TRAINING AND EVALUATION OUTLINE

TASK

PREPARE/OPERATE AN AN/TVS-4 (NOD).

EVALUATION

CONDITIONS:

As a forward observer, given an AN/TVS-4, under all weather conditions during daylight and darkness.

STANDARDS:

Inspect and perform preoperational checks and place an AN/TVS-4 into operation within 5 minutes.

TRAINING

1. Prior to opening shipping container in which NOD is stored, release any air pressure inside as instructed on side of case assembly.

2. Release all twelve latches, raise lid, and remove NOD from case **(CAUTION: Don't let direct sunlight or other bright light enter objective lens; it may damage the NOD.)**

3. Inspect outside for cracks, chips, warpage, etc. Insure all nameplates, verniers, and dials are readable. Examine lens for fogginess or signs of moisture.

4. Mount NOD on tripod (large or small) using adapter assembly and tighten the azimuth lock knob.

5. Install battery. Make sure power switch is off and switch guard down during installation. Plus (+) end goes into power supply assembly first.

6. Perform pre-op checks. Check NOD, canvas covers, cable assembly, flashlight and controls, for wear, moisture, breaks, etc.

7. Operate NOD; power switch on and adjust focus ring for sharp reticle image. **(NOTE: Once eyepiece focus adjustments are made by each operator, no further adjustments should be necessary.)** Adjust range focus ring for clear image.

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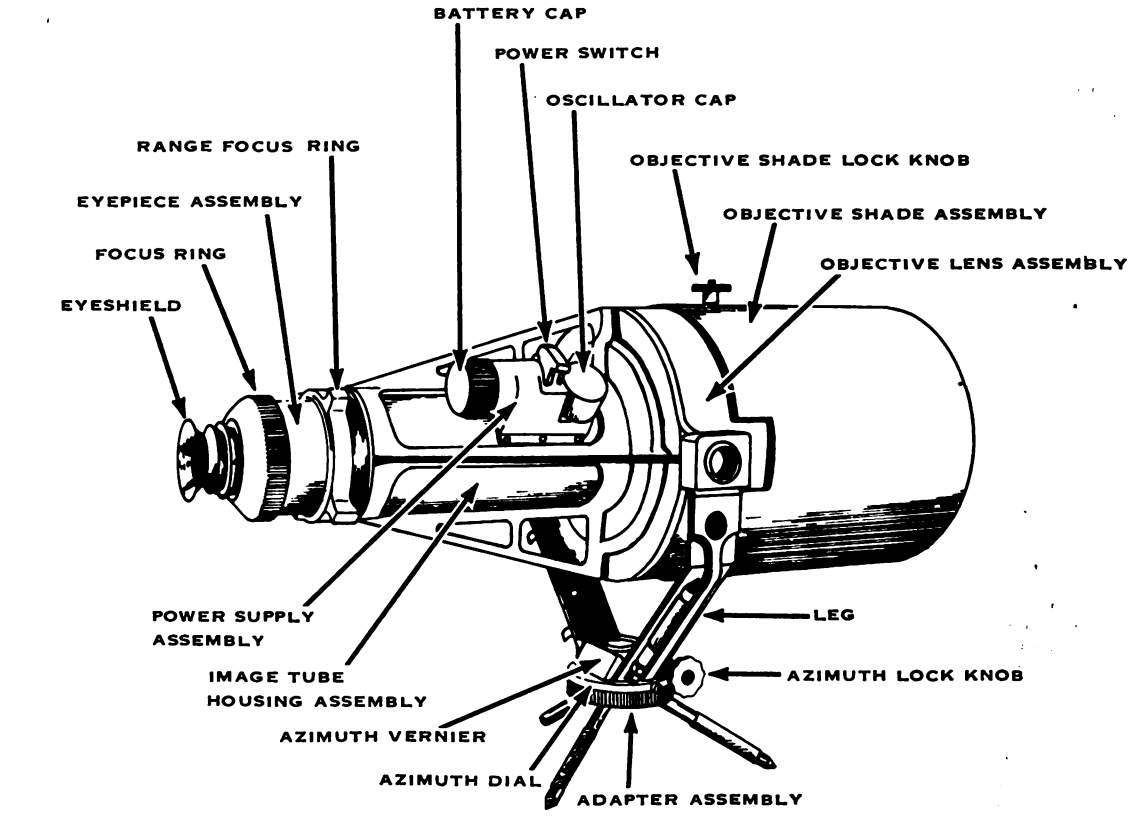

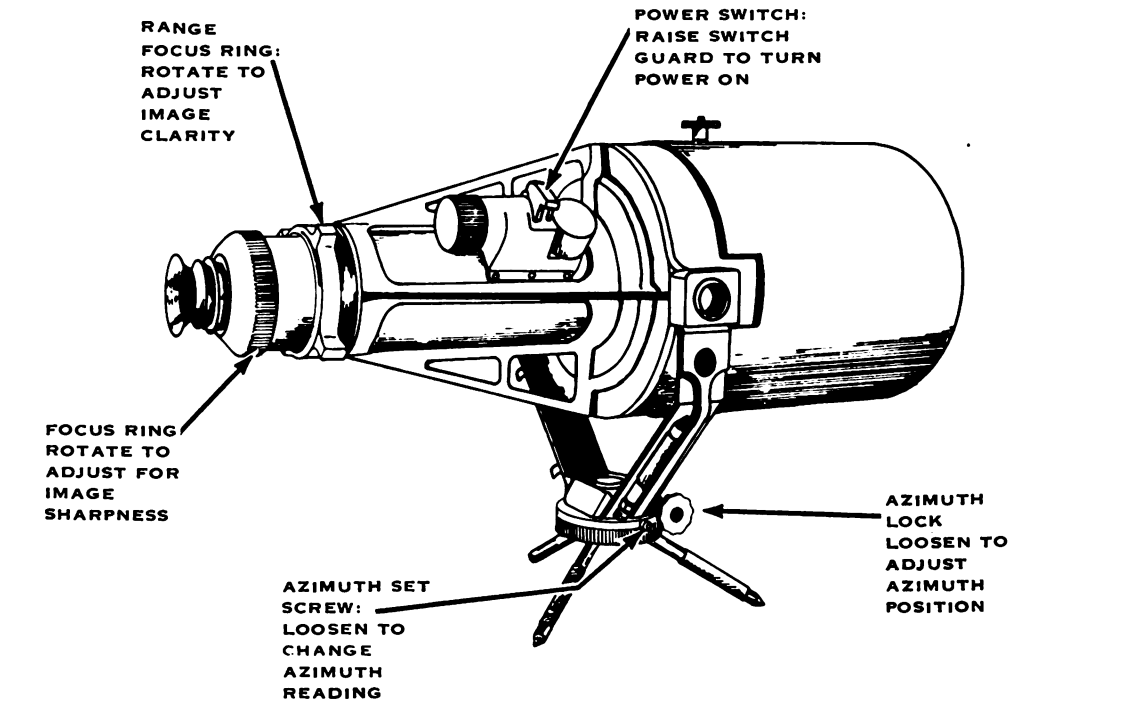
RANGE FOCUS RING: ROTATE TO ADJUST IMAGE CLARITY
POWER SWITCH: RAISE SWITCH GUARD TO TURN POWER ON
FOCUS RING ROTATE TO ADJUST FOR IMAGE SHARPNESS
AZIMUTH LOCK LOOSEN TO ADJUST AZIMUTH POSITION
AZIMUTH SET SCREW: LOOSEN TO CHANGE AZIMUTH READING

Figure 1.

2-IV-A-8.1

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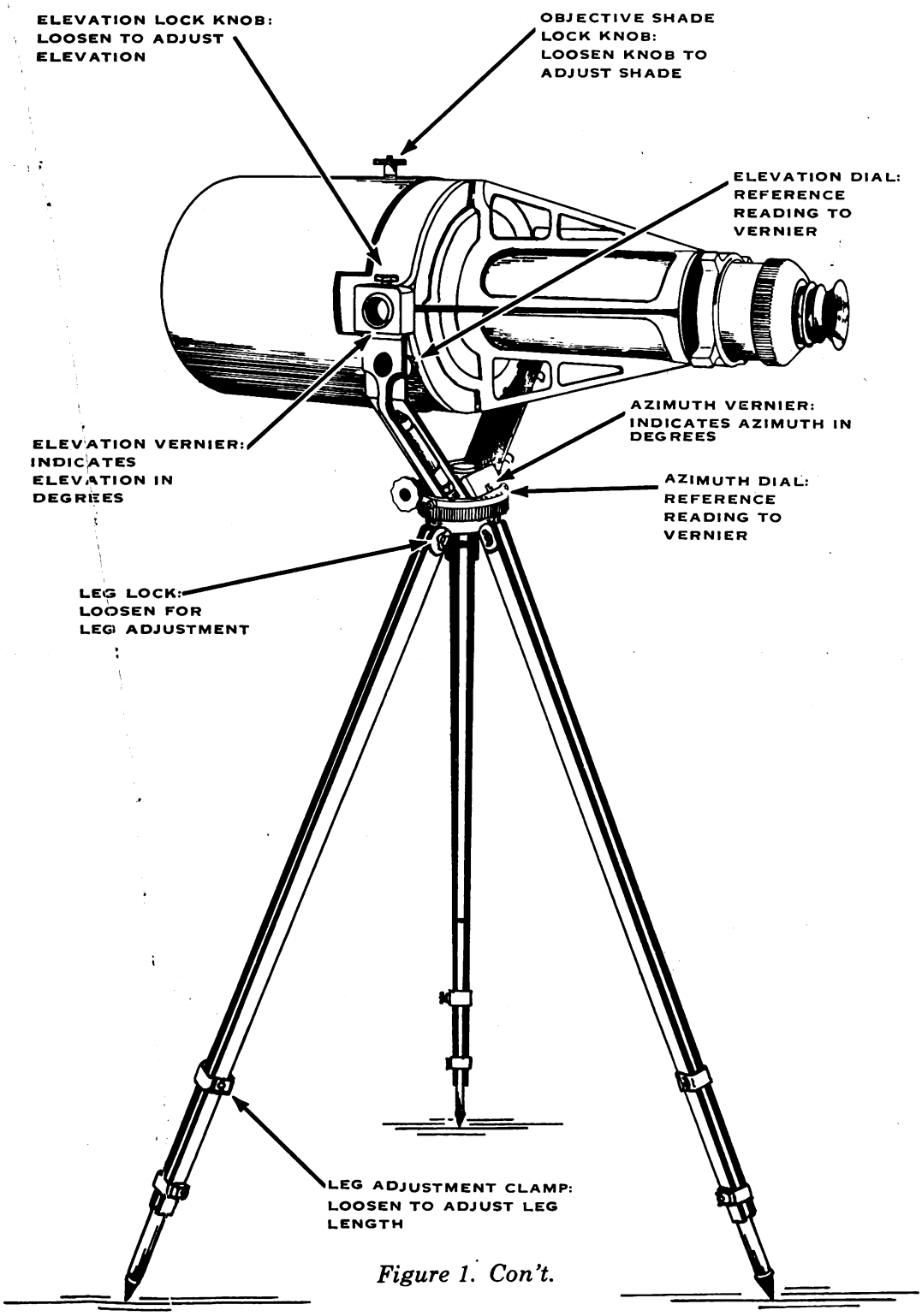

Figure 1. Con't.

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8. Loosen elevation knob and move eyepiece end of device to vertically center object. Loosen yoke mount lock knob and move eyepiece end till object is centered horizontally.

9. Operator maintenance is limited to keeping lens, covers, and outside surfaces free of dust, moisture, etc. When not in use, AN/TVS-4 is always stored and transported in its shipping case. Batteries are removed during storage.

TASK NUMBER: 071-11C-1508

REFERENCES:

TM 11-5850-228-13, Night Vision Sight, Tripod Mounted
TC 23-18, Night Observation Device, Medium Range

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TASK

ADJUST FIRE USING AN AN/TVS-4 (NOD)

EVALUATION

CONDITIONS:

As a forward observer, given an AN/TVS-4, radio, assigned callsigns and frequencies, compass and an observable target, under all weather conditions during hours of darkness.

STANDARDS:

Accurately adjust indirect fire using AN/TVS-4 to include:

1. Locating and reporting location of observed targets.

2. Centering target both vertically and horizontally.

3. Upon impact, reading to nearest 10 mils spottings for deviation and range.

TRAINING

1. Place night observation device (NOD) into operation. (See task: Prepare/Operate an AN/TVS-4 (NOD)).

2. Locate targets by traversing the NOD across area of observation; adjust range focus knob as necessary.

3. Once a target is located, use call for fire. If NOD is laid in on a known line or azimuth, direction can be read off the azimuth vernier (convert to mils). Elevation can be read off elevation vernier. (See TC 23-18 to lay in AN/TVS-4.)

4. Center target in reticle using elevation knob (for vertical movement) and yoke mount lock (for horizontal movement) and prepare to spot rounds.

5. After rounds impact, a spotting is made using the reticle pattern of the NOD. There are 10 millimeters between each dash, and each dash is 10 millimeters long. Between the center mark and the first dash is 5 millimeters. The vertical line is graduated in 10-meter increments.

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6. Corrections for range and deviation are then made by the same methods as during daylight adjustment of fire, i.e., the mil-relation formula. (See task: Call for/adjust indirect fire using the bracketing method.)

7. Infrared or other artificial illumination can be used to aid in target detection and fire adjustment.

TASK NUMBER: 071-11C-1509

REFERENCES:

FM 23-91, Mortar Gunnery
TC 23-18, Night Observation Device, Medium Range
TM 11-5850-228-13, Night Vision Sight, Tripod Mounted

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TRAINING AND EVALUATION OUTLINE

TASK

PREPARE M16 PLOTTING BOARD FOR OPERATION.

EVALUATION

CONDITIONS:

As the fire direction computer for an 81-mm mortar, given an M16 plotting board, 1:50,000 map, tabular firing tables and coordinates of the mortar position, and overlay of company's area of responsibility.

STANDARDS:

Prepare the M16 plotting board as a modified observed/surveyed firing chart within 5 minutes and accomplish the following:

1. Establish a coordinate system which represents all of the company's area of responsibility.

2. Determine the mounting azimuth to within 10 mils.

3. Superimpose the referred deflection that corresponds to the mounting azimuth.

4. Plot all known locations of mortars, targets, and registration points accurately to within 10 meters.

TRAINING

General: For instruction on the parts of the M16 plotting board and how to read its azimuth scales, see Task: Prepare M16 plotting board for operation (pivot point); and Task: Determine firing data for mortars using M16 plotting board (pivot point).

1. Parallel line Method (see figure 1).

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a. On map, measure grid azimuth from mortar position to reference point to within 10 mils.

b. Record grid azimuth from mortar position to reference point in margin of computer's record (DA Form 2399).

c. Compute mounting azimuth that is correct for your measurement of grid azimuth.

d. Record mounting azimuth in margin of computer's record.

e. Place referred deflection on azimuth disk.

f. Place a 1000-mil deflection scale on azimuth disk.

g. Compute chart deflection that is correct for your measurement of grid azimuth.

h. Record chart deflection on computer's record.

i. On map, measure range from mortar position to reference point (chart range) to within 25 meters.

j. Record chart range on computer's record.

k. Plot mortar position 2,000 meters below pivot point and 500 meters left or right of vertical centerline.

l. Plot reference point at chart range.

2. Modified Observed:

a. Determine grid coordinates of mortar position to within 10 meters.

b. Record grid coordinates of mortar position in margin of computer's record.

c. Determine grid coordinates of reference point to within 10 meters.

d. Record grid coordinates of reference point in margin of computer's record.

e. Select, on the map, a grid intersection which, when transferred to the pivot point of the plotting board, permits establishment of a coordinate system that allows all of the company sector of responsibility to be represented on the plotting board.

f. Establish on plotting board a coordinate system which represents all of company's area of responsibility.

g. Plot location of mortars on plotting board, without error.

h. Plot location of reference point on plotting board, without error.

i. On plotting board, determine grid azimuth from mortar position to reference point to within 10 mils.

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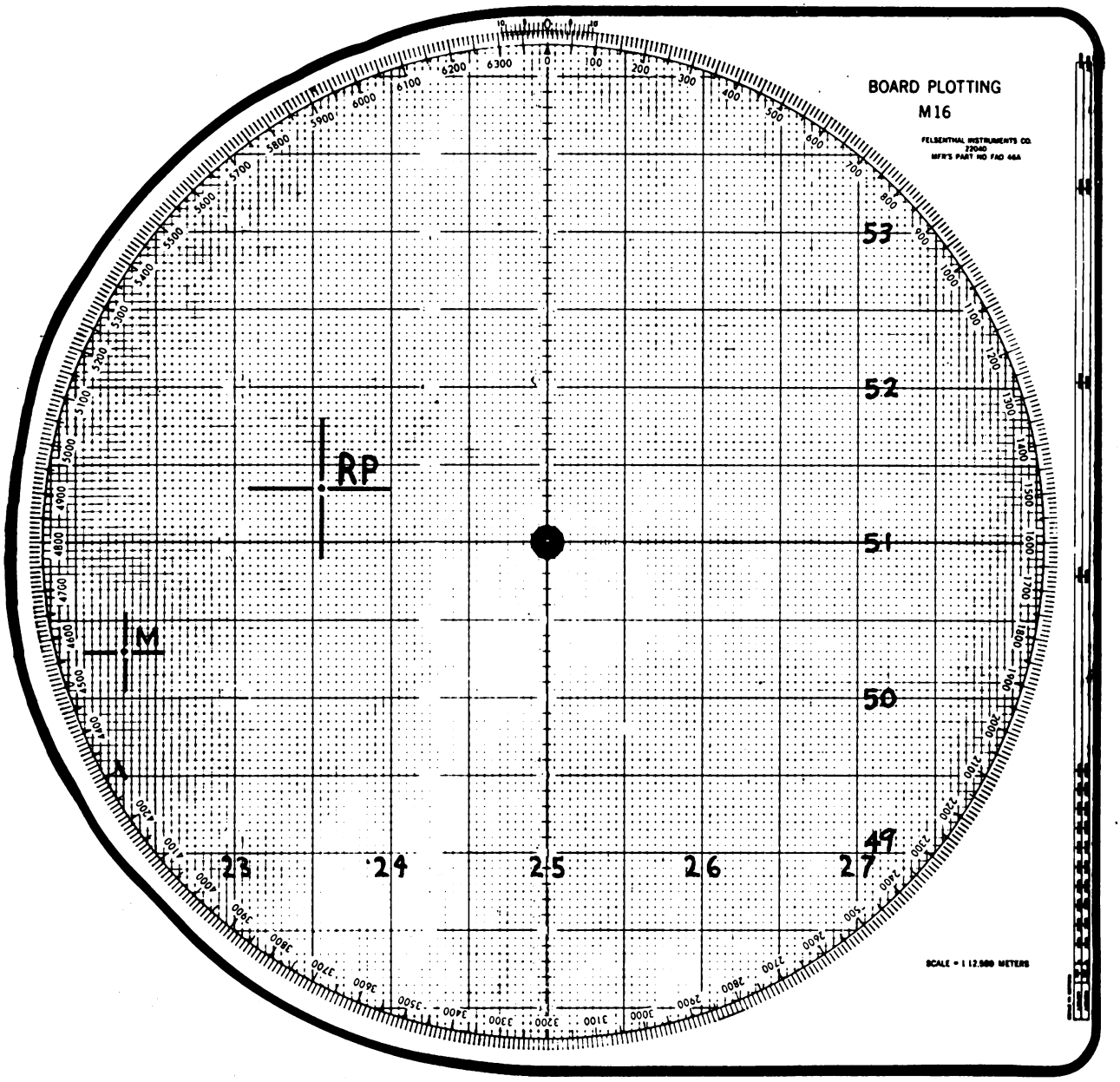

Figure 1.

2-V-A-3.2

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j. Compute mounting azimuth that is correct for your determination of grid azimuth from mortar position to reference point.

k. On plotting board, compute or measure range from mortar position to reference point (chart range) to within 25 meters.

l. Record chart range on computer's record.

m. Place referred deflection in correct location on azimuth disk.

n. Place a complete deflection scale on azimuth disk.

o. Determine chart deflection that is correct for your determination of grid azimuth from mortar position to reference point.

p. Record chart deflection on computer's record.

q. Plot company's area of responsibility on plotting board, with points defining sector accurate within 10 meters.

NOTE: A surveyed chart will be constructed when both mortar and RP positions are known to an 8 digit coordinate.

TASK NUMBER: 071-11C-1603

REFERENCES:

FM 23-91, Mortar Gunnery
TEC Lesson 010-071-6601-F, Prepare M16 Plotting Board for Operation

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TASK

DETERMINE FIRING DATA AND PROCESS SUBSEQUENT FO CORRECTIONS USING M16 PLOTTING BOARD.

EVALUATION

CONDITIONS:

As the fire direction computer of an 81-mm mortar, given an M16 plotting board, tabular firing tables, 1:50,000 map and coordinates of the mortar position, a target or registration point, subsequent corrections, and a computer's record (DA Form 2399).

STANDARDS:

1. Determine deflections to the nearest 10 mils.
2. Determine range to the nearest 25 meters.
3. Convert range to the correct charge and elevation.

TRAINING

1. Determining Azimuth. To determine the azimuth between the mortar section and the registration point or target, rotate the disk until the mortar position and the registration point are alined on the same vertical line or equally distant between the same two vertical lines with the mortar position to the bottom. Read the azimuth at the index mark. The azimuth is determined in the same manner used when plotting at the pivot point.

2. Range to Registration Point or Target. The range is interpolated to the nearest 25 meters by counting the number of 50-meter grid squares or measuring the distance between the two points with a straight edge and applying it to one of the range scales on the plotting board.

3. Superimposing the Deflection Scale. In order to superimpose the deflection scale at a 50-mil graduation on the disk, round the azimuth to the nearest 50 mils. This is the mounting azimuth. The deflection scale is then superimposed on the disk.

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4. Firing the First Round in Registration. The first round in the registration is fired at the deflection which corresponds to the actual azimuth to the registration point or target. Rotate the disk until the mortar plot and the registration point plot are parallel to a vertical grid line and read the deflection at the index mark.

5. Use of Corrections. Errors resulting from poor map inspection, map errors, or atmospheric conditions will be corrected in the data obtained in registration. Upon completion of registration, neither the coordinate location of the registration point nor the section position is replotted. The difference in adjusted data (obtained by registration) and plotted data is carried in the form of correction factors.

TASK NUMBER: 071-11C-1604

REFERENCES:

FM 23-91, Mortar Gunnery
TEC Lesson 010-071-6601-F, 02-F, 03-F, 04-F, 05-5 FDC, Observed Firing Chart Part 1 thru Part 4
TEC Lesson 010-071-6606-F, 07-F FDC, Modified Observed Firing Chart Method Parts 1 and 2
TEC Lesson 010-071-6608-F FDC, Coordinated Illumination/HE Mission
TEC Lesson 010-071-6609-F FDC, Danger Close/Final Protective Fires

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TASK

DETERMINE DATA FOR SHEAF ADJUSTMENT.

EVALUATION

CONDITIONS:

Given a section with the base mortar (#2) registered, FDC equipment, and a request for sheaf adjustment.

STANDARDS:

Determine firing data for sheaf adjustment to include:

1. Determining deflections to the nearest 10 mils.
2. Determining range to the nearest 25 meters.
3. Converting determined range to the correct charge and elevation.

TRAINING

1. In some cases, individual weapon corrections for deflection, fuze setting, charge, and elevation are computed and applied to get a special pattern of bursts. These corrections are called special corrections.

2. The term **sheaf** denotes the lateral distribution of the bursts of two or more weapons fired together. The width of the sheaf is the lateral distance (perpendicular to the direction of fire) between the centers of the flank bursts. The front covered by any sheaf is the width of the sheaf plus the effective width of one burst. A sheaf may be in any one of the following forms (figure 1):

a. Parallel sheaf (normal). A parallel sheaf is one in which the trajectories of all weapons are parallel.

b. Converged sheaf. A converged sheaf is one in which the trajectories intersect at the target.

c. Open sheaf. An open sheaf is one in which the lateral distance between the center of any two adjacent bursts is equal to the maximum effective width of one burst.

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3. After the registration by the base mortar is completed, the computer directs the observer to adjust the sheaf. Although the mortars are laid parallel with a compass or aiming circle, the sheaf produced on the ground in the target area may not be parallel. This may be caused by the differences in the settling of the baseplates of the mortars.

a. There are two methods to adjust the sheaf. The method used depends on the location of the observer with respect to the gun-target (GT) line (whether angle T is greater or less than 500 mils). The angle T is the difference between the azimuth of the GT line and the azimuth of the observer-target (OT) line.

b. Whenever possible, the computer selects an observer located near the GT line so that the angle T will be less than 500 mils.

4. Parallel sheaf. The computer issues a fire command to No. 1 and 3 mortars to fire a section right (or left) with the same adjusted deflection and elevation obtained by the No. 2 mortar. The observer sends back individual deviation corrections in meters for any burst that needs correcting to place it in the proper position in the sheaf. Using the mil-relation formula for the 81-mm mortar, the computer changes these corrections in meters to mils. These corrections are then applied to the deflection on the mortars. The mortars are relaid on the aiming post with this deflection. Another section right (or left) may be fired to recheck the sheaf if necessary.

NOTE: Any correction of 50 meters or more is refired. When a parallel sheaf is attained, the computer notifies the gunners to refer all mortar sights to a common deflection and to realine aiming posts. This common deflection is the deflection for the base (No. 2) mortar to hit the registration point. The computer disregards small range errors when adjusting the sheaf. The range determined for the base (No. 2) mortar is used by all mortars in the section.

5. For example, given a deflection of 2850 and a range of 1,200 meters, the observer's corrections are:

NUMBER ONE, LEFT THREE ZERO
END OF MISSION
SHEAF ADJUSTED

a. Mortar No. 3. Since no correction was reported by the observer for the No. 3 mortar, its position in the sheaf is correct. The computer determines the correct deflection for mortar No. 1 as in b below.

b. Mortar No. 1. The observer's correction of LEFT THREE ZERO (in meters) is equal to 25 mils at a range of 1,200 meters (using the mil-relation formula); the left 25 mils is added (LARS) to the deflection setting of 2850 because the observer's correction was left and becomes 2875 mils. The computer issues the command NUMBER ONE, DO NOT FIRE, DEFLECTION TWO EIGHT SEVEN FIVE, ELEVATION ONE TWO SIX EIGHT. The gunner of mortar No. 1 lays his mortar with the announced

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deflection and elevation. When the mortar is laid, the computer issues the following command:

SECTION
DEFLECTION TWO EIGHT FIVE ZERO
REFER
REALINE AIMING POSTS

The gunner of mortar No. 1 refers his sight to a deflection of 2850 mils and directs the No. 3 man in his squad to realine the aiming posts without moving the mortar. All mortars are then laid parallel with a common deflection of 2850 mils. Therefore, to fire a parallel sheaf on any target, each mortar of the section is given the same deflection, the one determined for the base mortar.

6. General. The plotting board may be used to convert the observer's corrections from meters to mils for mortars out of sheaf. This technqiue eliminates the need for the computer to convert the observer's correction to mils using the mil-relation formula or deflection conversion table and then applying the LARS rule to determine the deflection.

a. Procedure. The FO's correction in meters for the mortar out of sheaf is plotted as a shift from the registration point with the disk oriented on the OT azimuth. The range arm is then rotated over the plot, and the deflection is read at the centerline for the mortar(s) out of sheaf. After the deflection has been determined, the plot is removed from the plotting board. If the mortars are not plotted at the pivot point, the same procedure is followed except for the application of the parallel line method when determining the deflection-reading. The computer determines the deflection which would move the No. 2 mortar the distance specified by the observer in his correction. Since all mortars were fired with a common deflection, a deflection which would move the No. 2 mortar a specified distance would also move the No. 1 and/or No. 3 mortar the same distance.

b. Sample Problem. The section mounted on an azimuth of 2000 mils completed registration with a range of 2,450 meters and deflection 2749 mils. The section fires for sheaf adjustment and the observer reports, NUMBER THREE, RIGHT THREE ZERO. The observer's azimuth is 2150 mils. To plot the correction, rotate the disk to the observer's azimuth and make a plot 30 meters to the right of the registration point. Rotate the range arm over the plot and determine the deflection (2737). This is the deflection which would move the No. 2 mortar 30 meters to the right. Since No. 3 mortar has the same deflection as No. 2 mortar on the sight, it will also move the No. 3 mortar 30 meters to the right.

NOTE: Procedure when mortar section is located at pivot point or below.

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c. After the base mortar has adjusted on the registration point, the computer and the FO coordinate adjusting a converged sheaf. The computer determines the firing data to converge the sheaf on the registration point.

d. The FO adjusts each mortar except the base mortar on the registration point one at a time.

e. The computer orients the plotting board on the OT azimuth. He plots each correction with the plotting board oriented on this azimuth. He considers the registration point as the plot for the first round from each of the mortars. After each mortar completes the adjustment, the computer orients the board to the GT azimuth, then places a plot 30-35 meters (the distance between mortars) left and right of the final adjusted plot for each mortar. The range arm of the M16 plotting board can be used to determine the deflection for each mortar to open the sheaf when plotting from the pivot point. To do this, rotate the range arm to the desired position to the right of the registration point and determine the deflection for the No. 1 mortar. Repeat the process to the left for the No. 3 mortar.

f. After each mortar is laid with the correct deflection to form a parallel sheaf, the section is referred to a common deflection and the aiming posts are realined.

7. Converging Sheaf. It is sometimes necessary to converge the sheaf to engage targets of a special size and shape or to enable the FDC to adjust the sheaf of a unit when the FO is more than 500 mils off the GT line. The sheaf may be converged by using the mil-relation formula or by using the plotting board.

a. Formula Method. When using the mil-relation formula, the computer converts the distance in meters between mortars to mils at the range determined by the base mortar adjustment on the registration point or target. He applies the number of mils to the deflection of each mortar other than the base mortar, using the LARS rule.

b. Plotting Method. The computer determines the deflections for mortars No. 1 and No. 3 to hit the registration point. To do this, the computer alines the registration point plot with each mortar position and reads the deflection at the index mark. The mortar unit position plot on the disk represents the No. 2 (base) mortar of the unit. To determine the deflection for each of the other mortars, use either of the following methods:

(1) When the mortar position is located below the pivot point, the location of the No. 1 and 3 mortars can be plotted with respect to the base mortar. Do this by rotating the disk to the mounting azimuth (the section front is usually perpendicular to the mounting azimuth) and plotting the positions of No. 1 and 3 mortars 40 meters right and left of the dot on the index line (representing the No. 2 mortar).

(2) When the mortar position is located at the center of the plotting board, the pivot point obscures part of the grid. To determine the deflection for each mortar, the computer rotates the disk until the mark representing the desired location of the initial burst from each of the mortars appears as follows:

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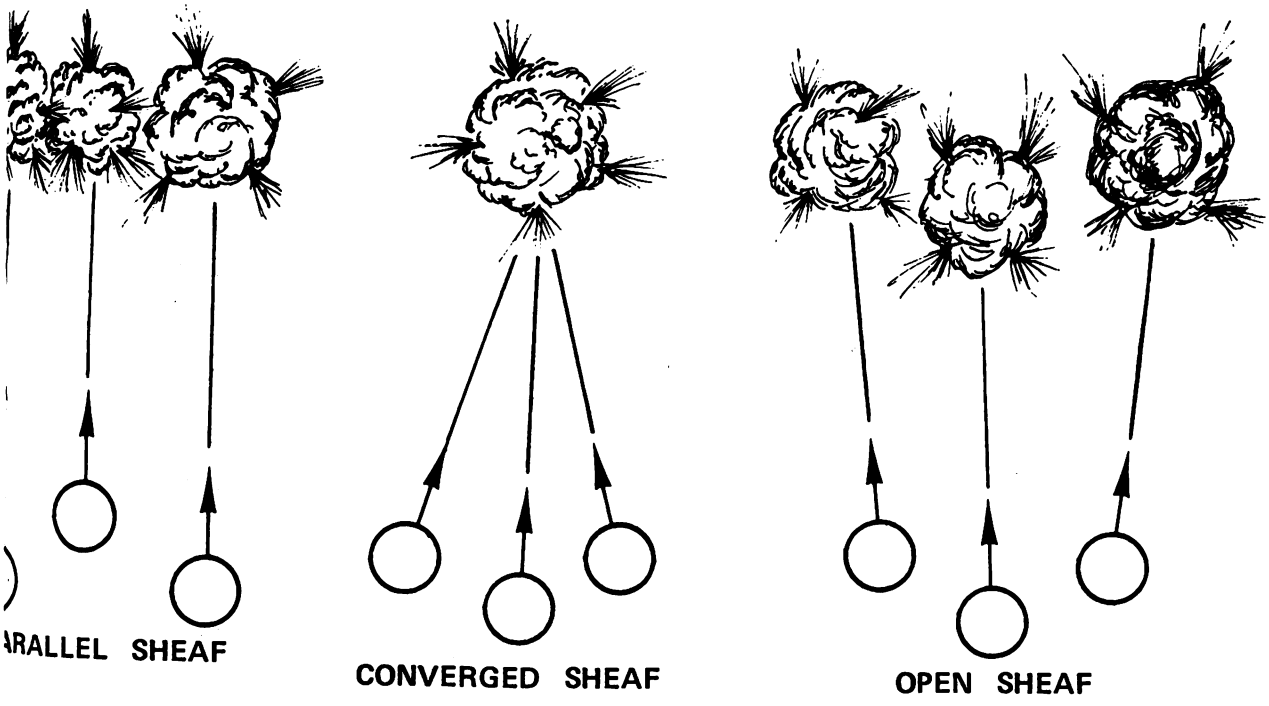
(a) No. 1 —— 35-40 meters right of the index line (the distance between mortars).

(b) No. 2 —— on the index line.

(c) No. 3 —— 35-40 meters left of the index line.

8. Open Sheaf. To open the sheaf, the FDC reverses the procedure as outlined in paragraph 2c above.

Example. To converge No. 1 mortar, the FDC adds to the No. 2 mortar's deflection. To open the sheaf, he would subtract from the No. 2 mortar's deflection.



SK NUMBER: 071-11C-1605

FERENCES:

23-91, Mortar Gunnery
C Lesson 010-071-6605-F, The Observed Firing Chart (Part IV)

Figure 1.

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TASK

DETERMINE DATA FOR RE-REGISTRATION AND APPLICATION OF CORRECTIONS.

EVALUATION

CONDITIONS:

Given a registration point and a directive to re-register and to determine the corrections to apply, FDC equipment, and firing data sheet.

STANDARDS:

Determine firing data for re-registration and apply corrections to include:

1. Determining deflections to the nearest 10 mils.
2. Determining range to the nearest 25 meters.
3. Converting range to correct charge and elevation.
4. Replotting target location registration point, etc., if necessary.
5. Posting corrections to firing data sheet.

TRAINING

1. The corrections determined from the initial registration will generally be valid for only a few hours. Changing weather, further settling of the baseplates, changes in ammunition temperature, and other factors tend to invalidate them. Therefore, every 3 to 5 hours, firing correction should be verified and updated if necessary. One way of doing this is the re-registration, in which the same registration point(s) is refired to determine how much firing corrections have changed.

2. The observer's corrections are plotted and data is computed and sent to the section. When the observer splits a 50-meter range bracket, he announces END OF MISSION, RE-REGISTRATION COMPLETE with his correction. The computer measures data and computes the final firing data, but it is not sent to the section. END OF MISSION is sent to the section. The chief computer may adjust the sheaf again if he has reason to suspect it, but generally this is not done.

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3. Apply corrections and replot all target registration points, etc. (if necessary).

4. Posts all corrections to firing data sheet.

TASK NUMBER: 071-11C-1606

REFERENCE:

FM 23-91, Mortar Gunnery

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TASK

RECORD INFORMATION ON FIRING DATA SHEET (81-MM).

EVALUATION

CONDITIONS:

As the fire direction computer for an 81-mm mortar platoon, given a pencil, DA Form 2188-R (blank), 1:50,000 map, location of OP and mortar section, and completed computer record(s) (DA Form 2399).

STANDARDS:

Complete all information on the data sheet (DA Form 2188-R) with no errors.

TRAINING

1. The data sheets are used to record and maintain up-to-date information and firing data for targets. These may be targets previously fired and of sufficient significance to maintain data on, or preplanned targets upon which fires are scheduled or data maintained on call. When firing corrections are updated through re-registration or the computation of MET corrections, all targets are update to reflect current firing conditions. DA Form 2188--R (figure 1) will be locally reproduced on 10½ x 8 inch paper.

a. Organization. Identification of the unit firing.

b. Mortar grid. Survey coordinates of section center. If the altitude of the section can be determined, it is written above the coordinates of the section.

c. Date. The date on which the data on the sheet is current.

d. Mounting data. The mounting azimuth on which the section was laid.

e. OP grid. If the location of any of the OPs is known by grid coordinates, the coordinates and its altitude are recorded here.

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DATA SHEET (81mm Mortar)

ORGANIZATION CO A 1-66 MORTAR GRID 09501605 ALTITUDE 728 DATE 15 JAN 70

MOUNTING AZ 4650 OP GRID: 1 09101706 2 3 OP ALT: 1 350 2 3 REFERRED DEFLECTION 2800

TARGET IDENT		CHART DATA		FIRING CORRECTIONS				FIRING DATA				INTELLIGENCE			
TGT. NG.	GRID	DEFL.	RN	DEFL. CORR.	RCF	ALT VI	ALT CORR.	DEFL	RN / CHG.	FUZE TIME SETTING	ELEV	TIME FIRED	TAR DESCR	METH OF ENGHT	SURVEILLANCE
RP	0990 1785	2848	1825	0	0	728 0	0	2848	1825 / 3	✓	1015	1500	RP	See (1) S/L	REG COMP
BK101	1010 1750	2679	1450	0	0	728 0	0	2679	1450 / 3	✓	1186	0630 19 MAR	PLAT: IN OPEN	SEC (5)	EST 10 CAS
BK102	0920 1810	2976	2550	0	0	778 +50	+25	2976	2575 / 5	✓	1072	1400 19 MAR	CO IN OPEN	SEC (8)	EST 25CAS
									/						
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DA Form 2188-1-R, 1 Oct 71

Figure 1.

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2. Data Section. The most current data for registration points and targets is recorded here; if the FO should call for a repeat of fires placed on one of these targets, the data can be sent directly to the section.

a. Target data. The target number and eight-digit coordinates locating it on the firing chart are written in this section. The target coordinates written here may not precisely locate a target on the ground (in fact, some firing charts are numbered with arbitrarily chosen coordinates); instead, these coordinates are important for maintaining consistency of all firing charts within the FDC.

b. Chart data. The deflection and charge (range) read from the firing chart at the target location are recorded here.

c. Firing corrections. The deflection correction written at the top of the computer's record used to fire the mission is used. After updating corrections or when transferring, the deflection correction read from the ballistic plate of the GFF (GFS) is used. The most accurate information on the target altitude and the corresponding altitude difference is recorded and used to compute the altitude correction.

d. Firing data. This section contains the most current firing data, in a form suitable for transmission to the section, namely, deflection, charge, and elevation.

e. Intelligence. Record information in this section which may be of value for future reference by the FDC or the S2. The time box is used for two purposes: when ammunition requiring a time setting is fired, the time setting is written here; and the time a mission was fired can also be written here. Target description, method of engagement, and surveillance are self-explanatory and should be clear from the examples.

TASK NUMBER: 071-11C-1607

REFERENCES:

FM 23-91, Mortar Gunnery
TEC Lesson 010-071-6604-F, The Observed Firing Chart (Part III)

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TRAINING AND EVALUATION OUTLINE

TASK
PREPARE A FIRING CHART FOR OPERATION AND DETERMINE INITIAL FIRING DATA.

EVALUATION

CONDITIONS:

As the fire direction computer of a 107-mm (4.2-in) mortar, given a firing chart, FDC kit, tabular firing tables, 1:50,000 map, and coordinates of the mortar position and target or registration point.

STANDARDS:

Prepare a firing chart for operation within 15 minutes and accomplish the following:

1. Establish a coordinate system.

2. Determine the mounting azimuth to within 5 mils.

3. Place out direction and deflection indices.

4. Plot all known locations of mortar, targets, and registration points to within 10 meters.

TRAINING

1. Construction of Azimuth Indices for the GFF.

a. Azimuths are used to describe the direction from a specific point to some other point of interest; for the azimuth to have meaning, the specific point from which it is measured usually must be known. On the firing chart, each point from which azimuths will be measured (plotted) must be plotted, and each point must have its own azimuth indices.

b. An azimuth index is a line constructed on the firing chart opposite which the numbering of the azimuth scale on the GFF can be read. The mil arc is numbered at 100-mil intervals from 0 through 9 (we actually read through 999), which mean that indices should be constructed at 1,000-mil intervals, and numbered in thousands of mils. The thousands digit of an azimuth will be read from the index; the hundreds digit, from the numbering on the mil arc; and the tens and units digits, by interpolation.

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c. Azimuth indices are constructed so that when the left edge of the range arm is alined on an azimuth which is an integral multiple of 1,000, the appropriately numbered index is opposite the 0 (right most) graduation of the arc. The procedure for constructing azimuth indices follows:

(1) Plot a location directly north or south (i.e., with the same easting coordinate), or east or west (i.e., with the same northing coordinate) of the vertex point at a range of about 3,000 meters, and place a pin in it.

(2) Place a vertex pin in the vertex point, and engage it with the vertex of the GFF. Orient the GFF so that the left edge of the range arm is tight against the plotting pin. Find the second digit of the azimuth along which the range arm is pointing (e.g., 2 for 3200). Locate the digit on the numbering of the azimuth scale of the mil arc, and place a plotting pin in the firing chart beside the corresponding long graduation (figure 1).

(3) Rotate the GFF so that the left edge of the range arm is over the index pinhole (the pin has been removed). Using the pencil, draw a fine line from the pinhole to 1 to 1½ inches from the mil arc. The index is labeled with the appropriate identification (**M** for mortar, **42** for the OP, with call sign **U742**).

(4) Enough azimuth indices shoud be placed out so that any azimuth within a mortar's (OP's) sector of responsibility can be determined. To construct an azimuth index 1,000 mils right (left) of a previously established index, measure 1,000 mils right (left) of the old index mark, place a pin beside the mil arc, and draw the index as in (3) above.

2. Measuring and Plotting Azimuths and Angles with the GFF.

a. Once the appropriate azimuth indices have been drawn, measurement of azimuths is quick and simple. Place a pin in the location to which an azimuth is desired, and rotate the range arm until its left edge is against the pin. The first digit of the azimuth is read from the information printed beside the index mark touching the scale. The second digit of the azimuth is read from the numbering superimposed on the azimuth scale of the mil arc. The third and fourth digits are read from the finer (unnumbered) graduations on the mil scale.

b. To plot an azimuth, rotate the GFF until the appropriate index mark touches the mil scale beside the desired azimuth.

c. To measure an angle with the GFF, place a vertex pin in the chart at the vertex of the angle, and engage it with the vertex of the GFF. Rotate the range arm to the left until it touches a pin pushed into the left edge of the angle. Place a pin in the chart next to the 0 mark on the azimuth scale. Rotate the range arm to the right until the left edge of the range arm is against a pin on the right edge of the angle. Read the azimuth opposite the pin by the azimuth scale; this is the size of the angle in mils. If the angle is over 1,000 mils, the index pin must be moved in increments of 1,000 mils until the right edge of the angle is reached. The size of the angle is then the azimuth read by the index pin plus however many thousands of mils the index was moved.

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d. The value for angle T may be computed by comparing the gun-target azimuth, read off the inner scale of the mil arc, and the observer direction. If the result is greater than 3200 mils, subtract it from 6400 to determine the actual value for angle T.

Example A

Gun-target azimuth	6000mils
Observer direction	4100mils
Results equals	1900mils

Value is between 500 and 2700 and is sent to observer as "angle T equals 1900."

Example B

Observer direction	6000mils
Gun-target azimuth	050mils
Results equals	5950mils
Value is greater than 3200, so	6400mils
subtract	-5950mils
Actual angle T equals	450mils

Value is less than 500 and is not sent to observer.

e. To plot an angle from a given point, much the same procedure is used. First, move the range arm of the GFF against a pin in the given point. If the angle is to be plotted to the right (left) of the given point, index 0 (the size of the angle to be plotted) on the azimuth scale with a pin. Rotate the range arm to the right (left) until the size of the angle to be plotted (0) is read at the index pin. The range arm then points along the desired direction. Measure the azimuth to the given point, and add (right shift), or subtract (left), the size of the angular shift to it. Index the result and the desired azimuth has been plotted.

3. Plotting a Point Located by Polar Coordinates or Intersection.

a. Polar Coordinates. The observer locates a point by polar coordinates in his call for fire by giving the direction and distance from his OP to the point. His position must be known to survey accuracy (8-digit coordinate), plotted on the firing chart, and azimuth indices constructed. The vertex pin is pushed into the plotted observer position, and engaged with the vertex of the GFF. Rotate the GFF until the appropriately numbered azimuth index touches the mil scale opposite the direction announced by the observer. The range arm then points along the observer's line of sight to the point. Slide the plastic cursor along the range arm until the manufacturer's gauge line is over the range announced by one observer. Place a plotting pin in the firing chart.

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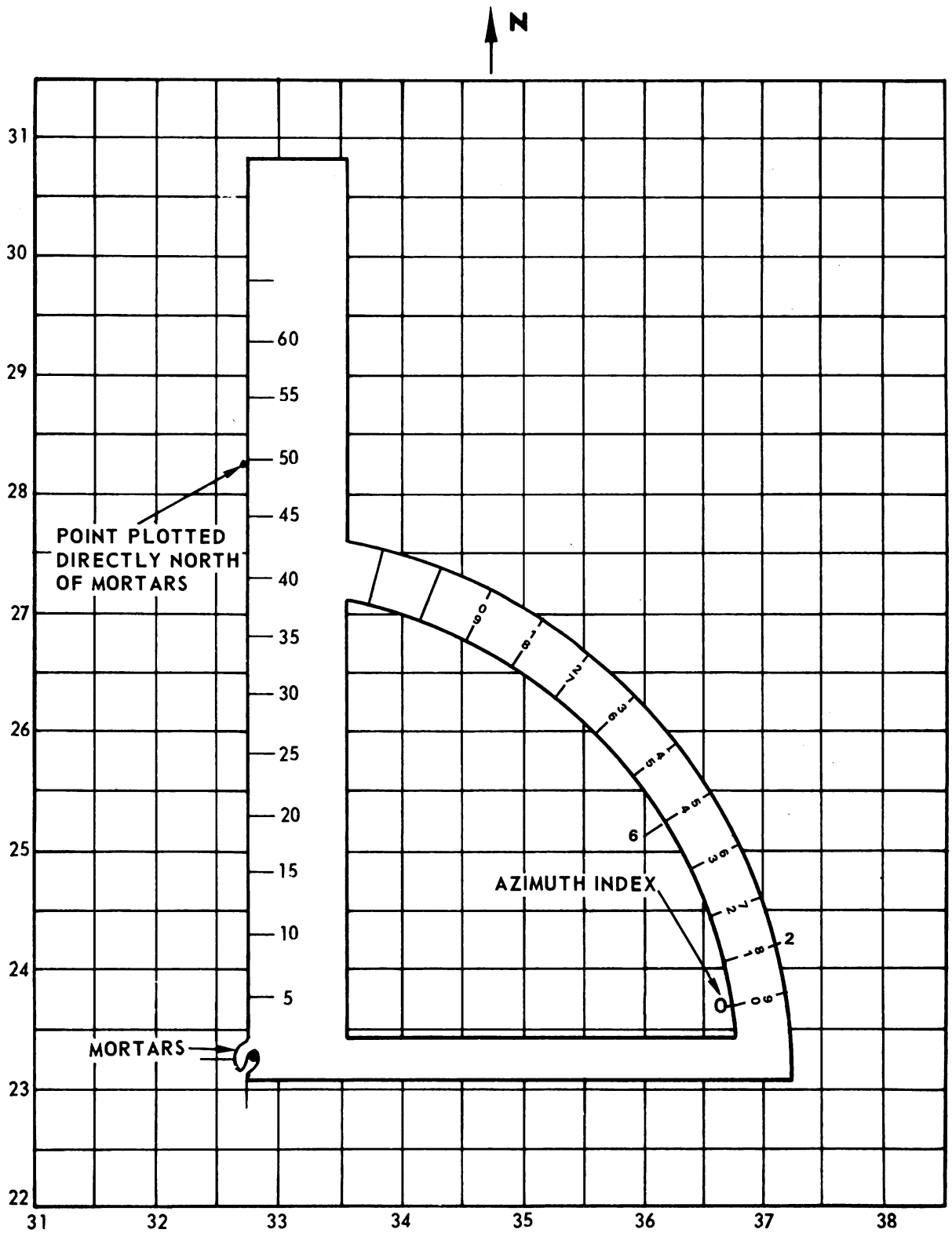

Figure 1.

2-V-B-1.3

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b. Intersection. The intersection method of target location requires two observers in surveyed locations. Each of them announces the direction from his position to the target point, and one of them may also give a vertical shift; however, no estimation of distance is necessary. A point located by intersection from two surveyed locations is considered surveyed if a shift not greater than 50 meters is required to list the target. On the firing chart, both OP locations must be plotted, and azimuth indices must be constructed. First, move the vertex pin to one of the OPs and position the GFF (RDP) so that the range arm points along the corresponding observer's direction to the target. Using the 6H pencil, draw a fine light line along the range arm. Repeat the process for the other OP. Where the two light lines cross, place a plotting pin; this is the location of the target. The FO who called the fire mission to the FDC will normally control the fire mission.

4. Target Grid.

a. General. The target grid is a convenient device for plotting shifts and corrections called in by the observer with respect to his line of sight. This procedure enables the observer to make all of his corrections with respect to the line connecting his position and the target (the OT line). In the FDC, on the other hand, all data is computed with respect to the gun-target (GT) line. A target grid is therefore used with each chart in the FDC to expedite plotting. An arrow extends across the target grid indicating the direction in which the observer is looking. Around the outside of the grid is an azimuth scale, graduated every 10 mils and numbered every 100. It is numbered counterclockwise because the scale is read opposite a stationary index on the chart.

b. Positioning the Target Grid. Whenever a target grid is first positioned and oriented, a pin must be placed in the center of the grid as a pivot. Since this center point is used very frequently, it wears quickly unless reinforced; a small piece of masking tape on the bottom side of the grid is normally used. With a pin through the center, the target grid may be placed anywhere and oriented as in c below; however, it will almost always be placed on a target previously plotted. When properly oriented, it can be used to shift from some known point to a new target.

c. Orienting the Target Grid. Once the target grid has been placed on the chart at some convenient location with a pin through the center to act as a pivot, an index must be drawn for proper orientation. This index is drawn directly north of the center of the grid in the following way.

(1) Rotate the target grid until the arrow points generally north.

(2) Make fine adjustments until the lines on the grid are exactly parallel to the grid lines on the firing chart.

(3) Mark the location of 0 on the azimuth scale with a pinprick on the chart, lift the target grid slightly and a fine line running in a north-south direction is drawn from slightly below the pinprick to about 1 inch above it. This index line is labeled with an "N" so it will not be confused with other indices.

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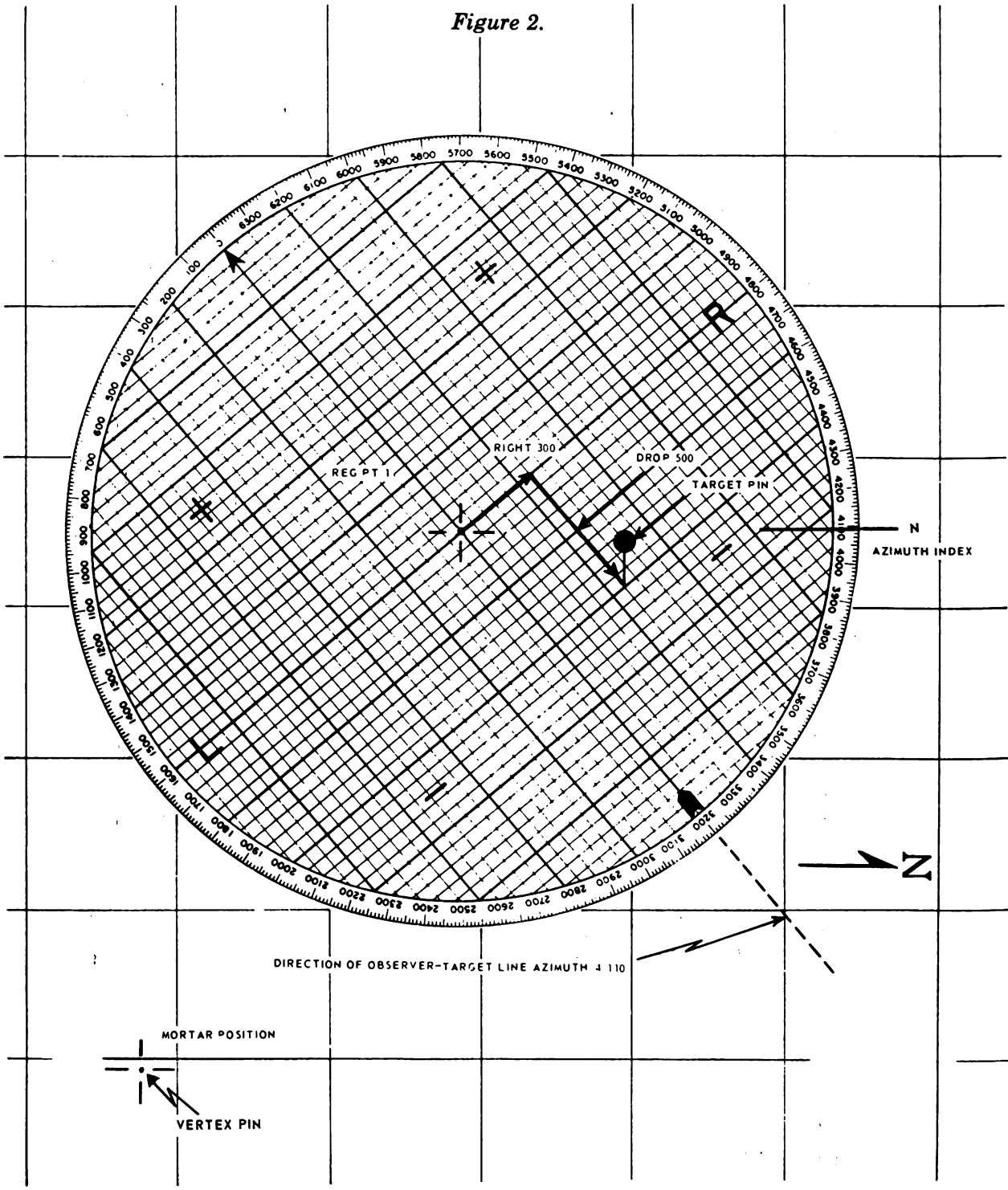
Figure 2.



(4) Rotate the target grid until the OT direction given in the call-for-fire is opposite the index mark. Observer-target direction is ALWAYS rounded to the nearest 10 mils.

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5. Angle T.

a. General angle T is the angle between the OT line and the GT line. It is significant when it reaches 500 mils, for at that point range changes with respect to the GT line begin to appear as deviation changes to the observer. It is an uncorrectable ballistic characteristic of mortars that range probable error (the statistical uncertainty as to exactly where along the GT line the round will impact) is fairly large; a round could easily land 25 meters over or short of a target, firing the same data. Deviation probable error is small by comparison. When angle T is over 500 mils, range probable errors begin to show themselves as deviations to the FO. He is, therefore, informed by the FDC when angle T is between 500 and 2700 mils, and halves all the deviation corrections he calls in. For the procedure to compute angle T, see paragraph 2.

b. Measuring Angle T with the GFF. If azimuth indices have been constructed for the gun position, angle T can be measured as discussed in the last part of paragraph 2 by finding the difference between the OT and GT azimuths. The OT azimuth was given by the observer in the call for fire. The GT azimuth is found by rotating the range arm of the GFF against a plotting pin in the target, and reading the azimuth where the appropriate index mark touches the azimuth scale on the mil arc.

c. Measuring Angle T Using the Target Grid. Since angle T need not be known to exact accuracy, the target grid may be used to measure it. To use the target grid for measuring any angle, the center of the grid must be over the target (where the OT line and the GT line intersect). The target grid is oriented along the observer azimuth given in the call for fire in the usual way; the observer's line of sight is represented by the 0-3200 line on the grid. To measure angle T, rotate the range arm into contact with the pin in the center of the target grid. Angle T is the angle between the range arm and the 0-3200 line on the grid; the computer should count graduations from whichever end of the 0-3200 line is visible over to the range arm. Each graduation on the target grid represents 10 mils, and that is the accuracy to which angle T is recorded.

d. Angle T is always measured and recorded on the computer's record (DA Form 2399) to the nearest 10 mils. If it is between 500 and 2700 mils, it is transmitted to the FO in the message to the observer rounded to the nearest 100 mils.

TASK NUMBER: 071-11C-1608

REFERENCE:

FM 23-91, Mortar Gunnery

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TRAINING AND EVALUATION OUTLINE

TASK

PROCESS SUBSEQUENT FO CORRECTIONS USING THE FIRING CHART.

EVALUATION

CONDITIONS:

As the fire direction computer of a 4.2-inch mortar, given a prepared firing chart and associated equipment, 1:50,000 map, tabular firing tables, coordinates of the mortar position, a target or registration point, and subsequent corrections.

STANDARDS:

Determine firing data and process FO corrections to include:

1. Determining deflections to the nearest 5 mils.
2. Determining range to the nearest 10 meters.
3. Converting range to the correct charge and elevation.

TRAINING

To process observer corrections using the firing chart:

1. Record the correction in the observer correction section of the computer's record (DA Form 2399).
2. Index FO's direction on target grid.
3. Plot the correction on the target grid with range to within 10 meters and deflection to within 5 mils.

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4. Record range and deflection in the **chart data** section of the computer's record.

5. Select the charge/elevation combination that is correct for the range recorded in the **chart data** section of the computer's record.

6. Apply range/deflection correction as necessary.

7. Steps 1-6 are repeated until target (registration point) is engaged.

8. Mark and label target.

TASK NUMBER: 071-11C-1609

REFERENCE:

FM 23-91, Mortar Gunnery

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TRAINING AND EVALUATION OUTLINE

TASK

DETERMINE DATA FOR SHEAF ADJUSTMENT.

EVALUATION

CONDITIONS:

Given a section with the base mortar (#2) registered, FDC equipment, and a request for a sheaf adjustment.

STANDARDS:

Determine firing data sheaf adjustment to include:

1. Determining deflections to the nearest 5 mils.
2. Determining range to the nearest 10 meters.
3. Converting determined range to the correct charge and elevation.

TRAINING

1. In some cases, individual weapon corrections for deflection, fuze setting, charge, and elevation are computed and applied to get a specific pattern of bursts. These corrections are called special corrections.

2. The term **sheaf** denotes the lateral distribution of the bursts of two or more weapons fired together. The width of the sheaf is the lateral distance (perpendicular to the direction of fire) between the centers of the flank bursts. The front covered by any sheaf is the width of the sheaf plus the effective width of one burst. A sheaf may be in any one of the following forms (figure 1):

a. Parallel sheaf (normal). A parallel sheaf is one in which the trajectories of all weapons are parallel.

b. Converged sheaf. A converged sheaf is one in which the trajectories intersect at the target.

c. Open sheaf. An open sheaf is one in which the lateral distance between the center of any two adjacent bursts is equal to the maximum effective width of one burst (figure 2).

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3. After the registration by the base mortar is completed, the computer directs the observer to adjust the sheaf. Although the mortars are laid parallel with a compass or aiming circle, the sheaf produced on the ground in the target area may not be parallel. This may be caused by the differences in the settling of the baseplates of the mortars.

a. There are two methods to adjust the sheaf. The method used depends on the location of the observer with respect to the gun-target (GT) line (whether angle T is greater or less than 500 mils). The angle T is the difference between the azimuth of the GT line and the azimuth of the observer-target (OT) line.

b. Whenever possible, the computer selects an observer located near the GT line so that the angle T will be less than 500 mils.

4. Parallel Sheaf. The computer issues a fire command to No. 1 and 3 and 4 mortars to fire a section right (or left) with the same adjusted deflection and elevation obtained by the No. 2 mortar. The observer sends back individual deviation corrections in meters for any burst that needs correcting to place it in the proper position in the sheaf. For the 107-mm (4.2-in) mortar, use the **100/R** scale. These corrections are relaid on the aiming post with this deflection. Another section right (or left) may be fired to recheck the sheaf if necessary.

NOTE: Any correction of 50 meters or more is refired. When a parallel sheaf is attained, the computer notifies the gunners to refer all mortar sights to a common deflection and to realine aiming posts. This common deflection is the deflection for the base (No. 2) mortar to hit the registration point. The computer disregards small range errors when adjusting the sheaf. The range determined for the base (No. 2) mortar is used by all mortars in the section.

5. For example, given a deflection of 2850 and a range of 1,200 meters, the observer's corrections are:

NUMBER ONE, LEFT THREE ZERO
END OF MISSION
SHEAF ADJUSTED

a. Mortar No. 3 and 4. Since no correction was reported by the observer for the No. 3 or 4 mortar, their position in the sheaf is correct. The computer determines the correct deflection for mortar No. 1 as in b. below.

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b. Mortar No. 1. The observer's correction of LEFT THREE ZERO (in meters) is equal to 25 mils at a range of 1,200 meters (using the 100/R factor or the mil-relation formula); the left 25 mils is added (LARS) to the deflection setting of 2850 because the observer's correction was left and becomes 2875 mils. The computer issues the command NUMBER ONE, DO NOT FIRE, DEFLECTION TWO EIGHT SEVEN FIVE, ELEVATION ONE TWO SIX EIGHT. The gunner of mortar No. 1 lays his mortar with announced deflection and elevation. When the mortar is laid, the computer issues the following command:

SECTION
DEFLECTION TWO EIGHT FIVE ZERO
REFER
REALINE AIMING POSTS

The gunner of mortar No. 1 refers his sight to a deflection of 2850 mils and directs the No. 3 man in his squad to realine the aiming posts without moving the mortar. All mortars are then laid parallel with a common deflection of 2850 mils. Therefore, to fire a parallel sheaf on any target, each mortar of the section is given the same deflection, the one determined for the base mortar.

6. General. The firing chart may be used to convert the observer's corrections from meters to mils for mortars out of sheaf. This technique eliminates the need for the computer to convert the observer's correction to mils using the mil-relation formula or deflection conversion table and then applying the LARS rule to determine the deflection.

a. Procedure. The FO's correction in meters for the mortar out of sheaf is plotted as a shift from the registration point with the disk oriented on the OT azimuth. The range arm is then rotated over the plot, and the deflection is read at the centerline for the mortar(s) out of sheaf. After the deflection has been determined, the plot is removed from the firing chart. The computer determines the deflection which would move the No. 2 mortar the distance specified by the observer in his correction. Since all mortars were fired with a common deflection, a deflection which would move the No. 2 mortar a specified distance would also move the No. 1-3 and/or No. 4 mortar the same distance.

b. Sample Problem. The section mounted on an azimuth of 2000 mils completed registration with a range of 2,450 meters and deflection 2749 mils. The section fires for sheaf adjustment and the observer reports, NUMBER THREE, RIGHT THREE ZERO. The observer's azimuth is 2150 mils. To plot the correction, rotate the disk to the observer's azimuth and make a plot 30 meters to the right of the registration point. Rotate the range arm over the plot and determine the deflection (2737). This is the deflection which would move the No. 2 mortar 30 meters to the right. Since No. 3 and 4 mortars have the same deflection as No. 2 mortar on the sight, these will also move the No. 3 and 4 mortar 30 meters to the right.

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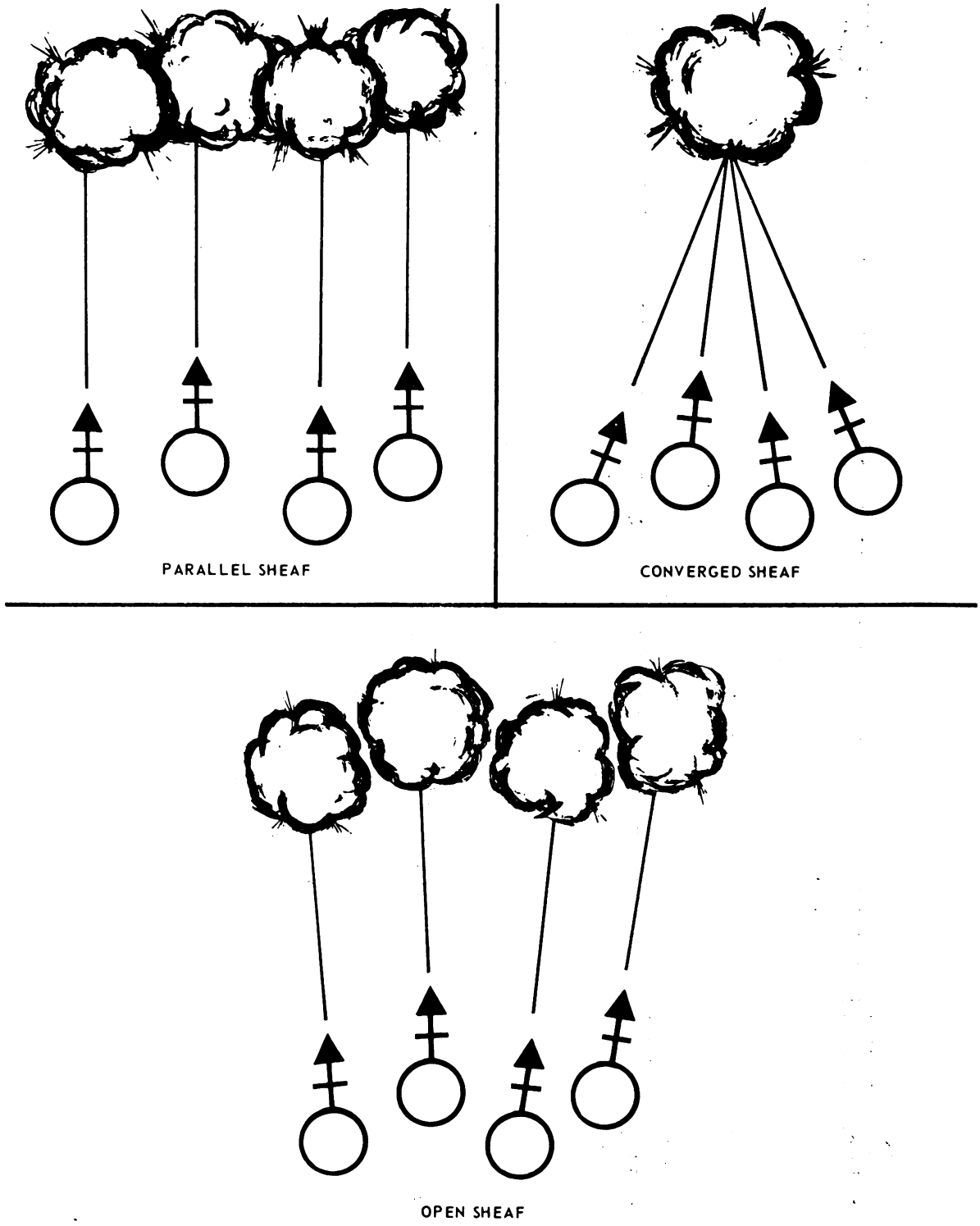

Figure 1.
2-V-B-3.3

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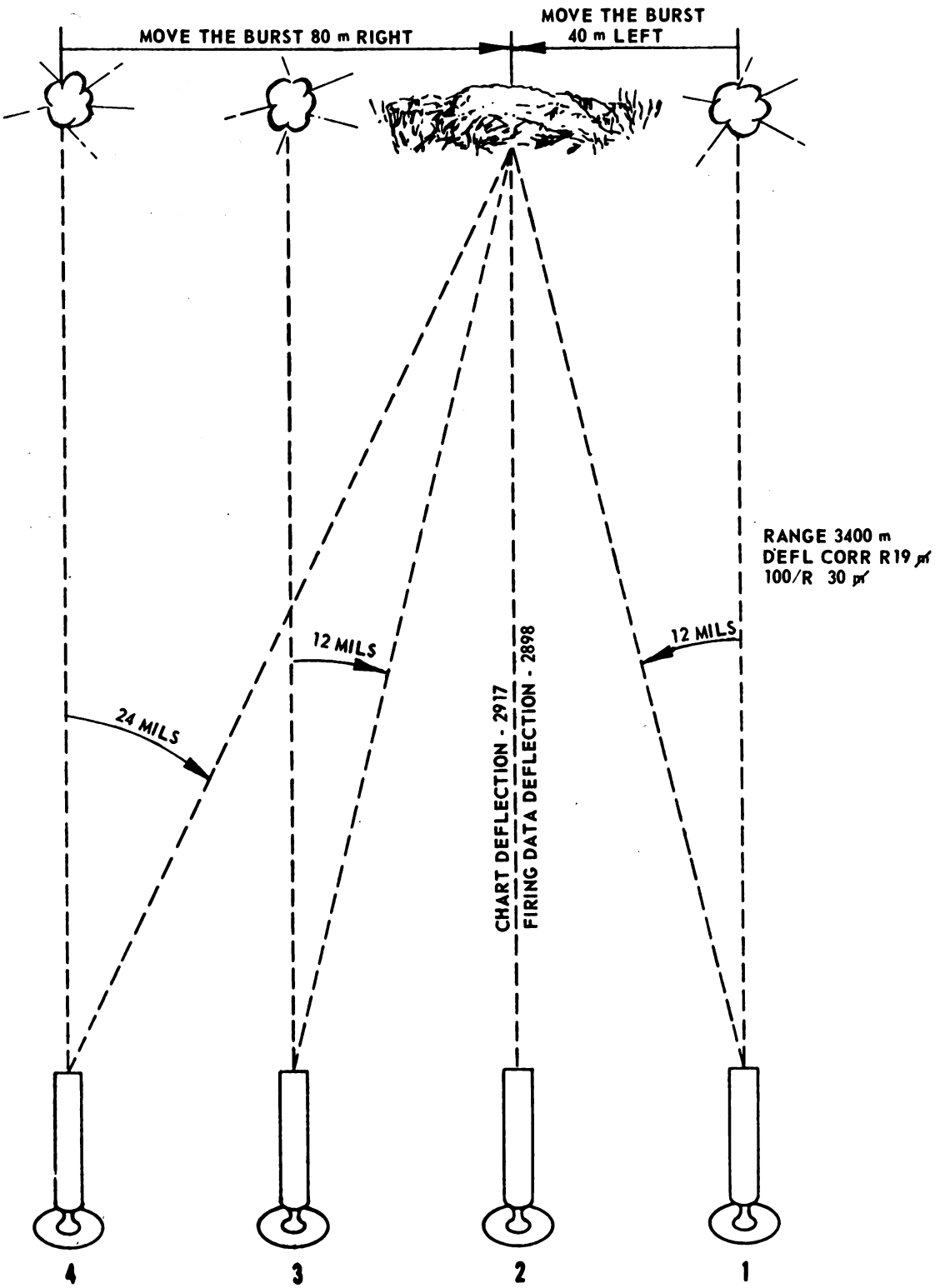

Figure 2.

2-V-B-3.4

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7. Converge Sheaf. The precision adjustment is normally conducted with the base mortar. A new element is added to the FDC order; CONVERGE ON (the adjusting mortar) is written under SHEAF CORR. Even though each mortar will fire a different deflection in effect, the entire section should be designated to follow the adjusting mortar during the adjustment. Then, when the observer calls for converge, the following mortars will have only a small deflection change to make, thus speeding the completion of the mission. The observer adjusts onto the target with the same precision as in the one mortar situation. When converge is called for, the entire section must fire on the spot to which the base mortar has been adjusted. The most accurate method of doing this would be to plot each mortar individually, construct a deflection index for each mortar, and read four different deflections to the final adjusting point. This procedure is so complex and time-consuming that it is rarely used. Instead, the 100/R factor is used to move the strike of rounds fired from the other mortars to the same spot as those fired from the adjusting mortar, as illustrated in figure 2. A separate line of the computer's record is used to record each mortar's deflection, the deflection itself being preceded by the number of the mortar to which it applies. For the situation depicted in figure 2, the firing (command) deflections would look like this:

1 - 2910

2 - 2898

3 - 2886

4 - 2874

8. To open sheaf, the FDC reverses the procedure outlined in paragraph 2c above.

TASK NUMBER: 071-11C-1610

REFERENCE:

FM 23-91, Mortar Gunnery

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TRAINING AND EVALUATION OUTLINE

TASK
DETERMINE DATA FOR RE-REGISTRATION AND APPLICATION OF CORRECTIONS.

EVALUATION

CONDITIONS:

Given a registration point and a directive to re-register and to determine the corrections to apply, FDC equipment, and firing data sheet.

STANDARDS:

Determine firing data for re-registration and apply corrections to include:

1. Determining deflections to the nearest 5 mils.

2. Determining range to the nearest 10 meters.

3. Apply corrections to firing chart and equipment.

4. Replotting of target registration points, etc., on firing chart (does not apply to surveyed chart).

5. Posting corrections to firing data sheet.

TRAINING

1. Corrections determined from the initial registration will generally be valid for only a few hours. Changing weather, further settling of the baseplates, changes in ammunition temperature, and other factors tend to invalidate them. Therefore, every 3 to 5 hours, firing corrections should be verified and updated if necessary. One way of doing this is the re-registration, in which the same registration point(s) is refired to determine how much firing corrections have changed.

2. The observer's corrections are plotted on the firing chart, and data is computed and sent to the section. When the observer splits a 50-meter range bracket, he announces END OF MISSION, RE-REGISTRATION COMPLETE with his correction. The computer measures chart data and computes the final firing data, but it is not sent to the section. END OF MISSION is sent to the section. The chief computer may adjust the sheaf again if he has reason to suspect it, but generally this is not done.

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3. Apply all corrections to firing chart and equipment.
4. Replot all RPs, etc., on firing chart. (Does not apply to surveyed chart.)
5. Post all corrections to firing data sheet.

TASK NUMBER: 071-11C-1611

REFERENCE:

FM 23-91, Mortar Gunnery

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TASK

RECORD INFORMATION ON FIRING DATA SHEET (107-MM (4.2-IN)).

EVALUATION

CONDITIONS:

As the fire direction computer for a 107-mm (4.2-in) mortar platoon, given a pencil, DA Form 2188-R (blank), 1:50,000 map, location of OP and mortar section, and completed computer record(s) (DA Form 2399).

STANDARDS:

Complete all information on the data sheet (DA Form 2188-R) with no errors.

TRAINING

1. The data sheets are used to record and maintain up-to-date information and firing data for targets. These may be targets previously fired and of sufficient significance to maintain data on, or preplanned targets upon which fires are scheduled or data maintained on call. When firing corrections are updated through re-registration or the computation of MET corrections, all targets are updated to reflect the current firing conditions. DA Form 2188-R will be locally reproduced on 10½ x 8 inch paper (figure 1).

a. Organization. Identification of the unit firing.

b. Mortar grid. Survey coordinates of section center. If the altitude of the section can be determined, it is written above the coordinates of the section.

c. Date. The date on which the data on the sheet is current.

d. Mounting data. The direction of fire determined for mounting purposes is recorded on the proper line. The draft used to compute the mounting azimuth is recorded above the DOF, and finally the mounting azimuth on which the section was laid.

e. OP grid. If the location of any of the OPs is known by grid coordinates, it and its altitude is recorded here.

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DATA SHEET (4.2 INCH MORTAR)

ORGANIZATION: 1-66 INF MORTAR GRID: 02658625 ALTITUDE: 150 DATE: 15 JAN 70

DIR OF FIRE: 0350 DRIFT 31 MT AZ 0319 O. P. GRID (1) 03458780 O. P. ALT (1) 350
(3) 05898763 (3) 175

TARGET IDENT		CHART DATA		FIRING CORRECTIONS			FIRING DATA				INTELLINGENCE			
TGT NO.	GRID	DEFL	RG CHG	DEFL CORR	ALT VI	CHG CORR	DEFL	CHG	FUZE TIME SETTING	ELEV	TIME FIRED	TARGET DESCR.	METH OF ENGMT	SURVEILLANCE
RP	0331 8809	2800	11 7/8	R11	210 / +60	+ 2/8	2789	12 1/8	✓	900	1330	RP	SEC ① S/L	REG COMP.
AA0050	0303 8865	2988	14 7/8	R8	210 / +60	+ 2/8	2980	15 1/8	✓	900	1420	PLAT IN OPEN	SEC ③ 100M ZONE	EST 10 CAS.
AA0051	0364 8895	2792	17 5/8	R3	300 / +150	+ 4/8	2789	18 1/8	✓	900	1440	WOODEN BLDG	M 4 ⑩ HED	BLDG DST EST 5 CAS
AA0052	0410 8760	2315	12	R12	50 / -100	- 4/8	2303	11 4/8	✓	900	1500	TRUCK ON ROAD	SEC ⑤ HEQ	TRUCK DEST EST 3 CAS
AA0053	0341 8788	2708	10 6/8	R13	70 / -80	- 3/8	2695	10 3/8	20	900	1615	CO IN FOX HOLE	SEC ⑤ HEP 200M ZONE	EST 60 CAS

DA Form 2188-R

Example of Re-registration Mission.

Figure 1.

2-V-B-5.1

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2. Data Section. The most current data for registration points and targets is recorded here; if the FO should call for a repeat of fires placed on one of these targets, the data can be sent directly to the section.

a. Target data. The target number and eight-digit coordinates locating it on the firing chart are written in this section. The target coordinates written here may not precisely locate a target on the ground (in fact, some firing charts are numbered with arbitrarily chosen coordinates); instead, the coordinates are important for maintaining consistency of all firing charts within the FDC.

b. Chart data. The deflection and charge (range) read from the firing chart at the target location are recorded here.

c. Firing corrections. The deflection correction written at the top of the computer's record used to fire the mission is used. After updating corrections or when transferring, the deflection correction read from the ballistic plate of the GFF (GFS) is used. The most accurate information on the target altitude and the corresponding altitude difference is recorded and used to compute the altitude correction.

d. Firing data. This section contains the most current firing data, in a form suitable for transmission to the section, namely, deflection, charge, and elevation.

e. Intelligence. Record information in this section which may be of value for future reference by the FDC or the S2. The time box is used for two purposes: when ammunition requiring time setting is fired, the time setting is written here; and the time a mission was fired can also be written here. Target description, method of engagement, and surveillance are self-explanatory and should be clear from the examples.

TASK NUMBER: 071-11C-1612

REFERENCE:

FM 23-91, Mortar Gunnery

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TRAINING AND EVALUATION OUTLINE

TASK

ADJUST FIRE WITHOUT AN FDC.

EVALUATION

CONDITIONS:

As a mortar squad leader/FO in a field environment, without an FDC, given binoculars, compass, identifiable target, and designated OP position.

STANDARDS:

1. The observer must be within 100 meters of the mortar position or he must be within 100 meters of the mortar target line.

2. Within 10 minutes, the observer must achieve effect on target within 5 adjustments. The round must land within 50 meters of an area target or 25 meters of a point target to achieve effect on a target.

TRAINING

1. General. Under certain conditions (communications failure, lack of equipment, etc.), it may be impossible to use an FDC. In fire without an FDC, the FO makes corrections differently than when operating with an FDC. He makes all his deviation corrections with respect to the gun-target (GT) line rather than with respect to the observer-target (OT) line. All deviation corrections are sent in mils or turns of the traversing handwheel. (For correction by turns, see task: Call for/adjust a screening mission.)

2. Observer within 100 meters of the mortar position. The best location for the FO for rapid fire adjustment is at the mortar position where his deviation spotting and deflection corrections (in mils) to be put on the sight are the same. Normally, however, the FO will be in a position other than at the mortar; but if he is within 100 meters of the gun, the deviation error that he reads in his binoculars can be applied directly to the sight without computation. For example, if the FO, from a position within 100 meters of

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the mortar, observes the burst to the left of the target and reads that it is 40 mils left on the mil scale of his binoculars, he orders a correction of RIGHT FOUR ZERO. This correction is sent to the mortar in mils, and is not converted to meters. The gunner applies this correction directly to the previous deflection setting using the LARS (left add, right subtract) rule.

3. Observer more than 100 meters from the mortar position. When the FO cannot be within 100 meters of the mortar, he must locate himself within 100 meters of the GT line. This might present some difficulty in visualizing the GT line and getting within 100 meters of it. If the FO is attacking targets over a wide frontage, he would have to move frequently. In this case, the angle between the gun-burst and the GT line is not equal to the angle between observer-burst and the GT line. Computation must be made to correct the differences in these angles. For example, if the FO is halfway between the mortar and the target, the correction to make on the sight is half his deviation spotting; if the mortar is halfway between the FO and the target, the correction is twice his deviation spotting. As other distances give other ratios, it is necessary to apply a correction factor to the number of mils spotted before ordering a deflection change. This factor is a fraction, the numerator of which is the OT distance, and the denominator of which is the GT distance; that is:

For example, if the distance from the FO to the target is 1,000 meters and the GT distance is 1,200 meters, and the deviation of the burst from the target as read by the FO is 60 mils (figure 1), the correction is:

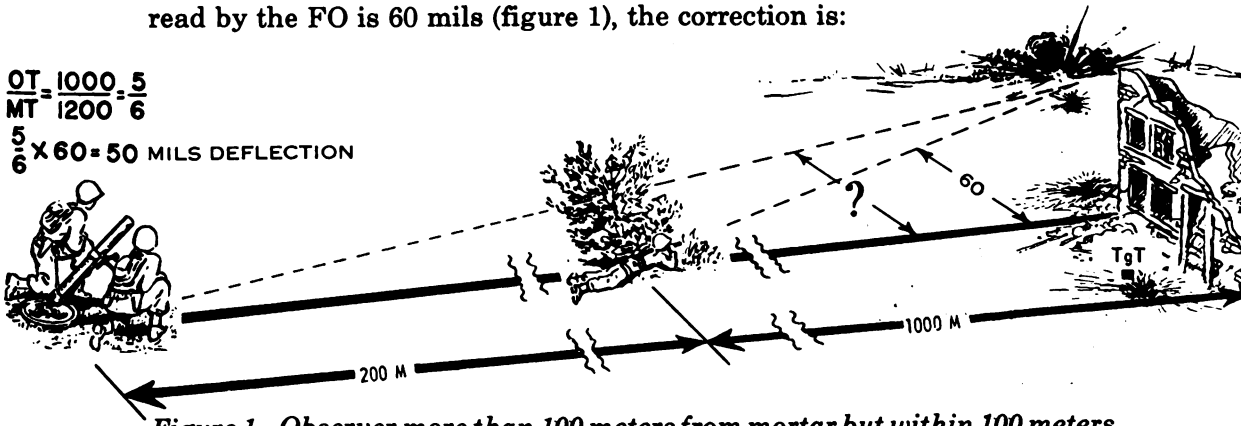

Figure 1. Observer more than 100 meters from mortar but within 100 meters of mortar-target line.

4. To adjust for range use the bracketing method of adjustment as outlined in task 2-IV-1. Turns may also be used to adjust for range. (Example: round lands over target - search up 8 turns - next round lands short, you should search down 4 turns to bracket target and continue splitting bracket until target is hit.)

TASK NUMBER: 071-11C-3922

REFERENCE:

FM 23-90, 81-mm Mortar

FM 23-92, 4.2-in Mortar, M30

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TASK
LAY MORTAR FOR DIRECTION USING DIRECT ALINEMENT METHOD (FIRE WITHOUT FDC).

EVALUATION

CONDITION:

As a mortar squad leader, given a mounted mortar in a defilade position, the mortar complete with sight and an aiming post or stake with cross arm (T-bar), an observable target, and a gun crew.

STANDARDS:

Within 5 minutes, aline the mortar and the aiming post or stake with the target.

TRAINING

Direct alinement procedure. To find the direction in which to lay the mortar, the squad leader first picks the area where the mortar will be mounted, keeping in mind that it must be in defilade. In alining the mortar on the target, the squad leader can use an aiming post, but the most accurate method is to use some sort of aiming stake with a cross-arm on it. To do this the squad leader moves to a point where he can see the target and also see the mortar. He then positions the stake with the cross-arm pointed at the target; without disturbing the stake he reverses his position so as to sight back along the cross-arm and directs the positioning of the mortar. The gunner sees that a 3200 (0-M34A2) deflection is set on the sight and vertical crossline is on this aiming stake. The mortar is now alined and ready to be fired. When registration or adjustment has been completed, aiming posts can be placed out on a referred deflection as in normal procedure. All fire commands and subsequent corrections from the squad leader/FO are sent to the gunner and set on the sight.

NOTE: Two narrow pieces of wood from an ammo box nailed together to form a cross will serve as the aiming stake (T-bar).

TASK NUMBER: 071-11C-3923
REFERENCE:
FM 23-90, 81-mm Mortar
FM 23-92, 4.2-in Mortar, M30

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TASK

LAY MORTAR FOR DIRECTION USING M2 AIMING CIRCLE.

EVALUATION

CONDITIONS:

Given an M2 aiming circle and a prescribed azimuth.

STANDARD:

Within 5 minutes, mount the M2 aiming circle so that the 0-3200 line is parallel to the mounting azimuth.

TRAINING

1. When all mortars in the section are mounted, the section leader/squad leader lays the section parallel on the prescribed azimuth with an aiming circle. The mortar section normally fires a parallel sheaf (figure 1). To get this sheaf, the mortars must be laid parallel. When a section moves into a firing position, the FDC determines the azimuth on which the section is to be laid and notifies the section leader. Before laying the mortars parallel, the sights must be calibrated. All mortars are then laid parallel using the aiming circle, the mortar sight, or a compass.

2. The section is normally laid parallel by following two steps:

a. Establish the 0-3200 line of the aiming circle parallel to the mounting azimuth.

b. Lay the section parallel to the 0-3200 line of the aiming circle (reciprocal laying).

3. Reciprocal laying.

a. **General.** Reciprocal laying is a procedure by which the 0-3200 line of the aiming circle and the 0-3200 line of the sight are laid parallel. When they are parallel, the tube is parallel to both 0-3200 lines if the sight has been properly calibrated.

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b. **Procedure.** Orient the aiming circle so that the 0-3200 line of the aiming circle is parallel to the mounting azimuth. The section leader, using the upper motion of the aiming circle, sights on the lens of the sight, reads the deflection on the azimuth micrometer scales, and announces the deflection to the gunner on the mortar. The gunner sets off the deflection on the sight and has the mortar moved until the vertical crossline of the sight is sighted on the lens of the aiming circle and the mortar is level. When the sight has been sighted on the aiming circle, the gunner reports READY FOR RECHECK. The section leader again sights on the lens of the sight, and reads and announces the deflection. Repeat this procedure until the gunner reports a difference of zero (or one) mil between successive deflections. The mortar has then been laid.

c. **Reciprocal laying on a grid azimuth.** The following illustrates the procedure for reciprocal laying of the section on a grid azimuth.

(1) The FDC normally directs the section to lay the mortar parallel on a mounting (grid) azimuth.

(2) The section leader receives the command MOUNTING AZIMUTH 5580 MILS from the FDC. (Apply drift for 107-mm (4.2-in) mortar.)

(a) The mounting azimuth is 5550 and the aiming circle has a declination constant of 0450 mils (m).

Declination constant	0450m
	+6400m
	6850m
Minus the mounting (grid azimuth)	-5550m
Remainder to set on aiming circle	1300m

(b) The section leader/squad leader mounts and levels the aiming circle at a point from which he can see the sights of all the mortars in the section (usually the left front or left rear of the section).

(c) He sets 1300 mils on the azimuth and micrometer scales of the aiming circle (recording motion).

(d) Using the orienting knob, he centers the magnetic needle in the magnetic needle magnifier. This orients the 0-3200 line of the aiming circle in the desired direction (mounting azimuth 5550).

(e) The section leader/squad leader announces SECTION, AIMING POINT THIS INSTRUMENT.

(f) All gunners refer their sights to the aiming circle with the vertical crossline laid on the center of the aiming circle. The gunner then announces NO. 2 (or 1, or 3, or 4), AIMING POINT IDENTIFIED.

(g) To lay the mortar tube parallel to the 0-3200 line of the aiming circle, the section/squad leader turns the upper motion of the aiming circle until the vertical crossline is laid on the center of the lens of the sight. He reads the azimuth and micrometer scales and announces the deflection. For example, NO. 2, DEFLECTION 1998.

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NOTE: When the M53 sight is used, it is calibrated at 3200 mils on the red deflection and micrometer scales. All readings from the aiming circle to the sight are set on the red deflection scale and the mortar is laid on the aiming circle using this scale. Readings from 0 to 6400 must be given to the mortar when using the M53 sight. When using the M34A2 sight, the aiming circle operator never reads a deflection greater than 3199 mils, because the gunners cannot set deflections greater than 3199 mils (on the azimuth scale). The operator reads the deflection from the lower row of figures (the back azimuth scale).

(h) The gunner repeats the announced deflection (NO. 2, DEFLECTION 1998) and sets it on his sight. Aided by the assistant gunner, he lays the mortar so that the vertical line is once again laid on the center of the aiming circle. After the mortar has been laid and the bubbles are level, the gunner announces NO. 2, READY FOR RECHECK.

(i) Using the upper motion of the aiming circle, the section/squad leader again lays the vertical crossline of the aiming circle on the lens of the sight. He reads the new deflection from the azimuth and micrometer scales and announces the reading. For example, NO. 2, DEFLECTION 2000.

(j) The gunner repeats the new deflection (NO. 2, DEFLECTION 2000) and sets it on his sight. Aided by the assistant gunner, he lays the gun with the vertical crossline of the sight on the center of the aiming circle and announces NO. 2, READY FOR RECHECK.

(k) The procedure is repeated until the mortar sight and the aiming circle are sighted on each other with a difference of not more than ONE mil between the deflection readings. When so laid, the gunner announces NO. 2, ZERO MILS (ONE MIL), MORTAR LAID. The tube is now laid parallel to the 0-3200 line of the aiming circle (figure 2).

(l) The section/squad leader uses the same procedure to lay each of the other mortars in the section parallel. When all mortars are parallel to the 0-3200 line of the aiming circle, they are parallel to each other and laid in the desired azimuth (figure 3).

NOTE: The section can be laid parallel rapidly by laying all mortars simultaneously. The instrument operator reads deflections to each mortar in turn. As soon as the gunner of any mortar announces READY FOR RECHECK, the section/squad leader reads the new deflection to that mortar. By laying all mortars at the same time, the section is ready to fire in little time.

(m) As soon as each mortar is laid, the section/squad leader commands DEFLECTION 2800, REFER, PLACE OUT AIMING POSTS. (The aiming posts are normally placed out on a referred deflection of 2800 mils.) Each gunner, without disturbing the lay of his mortar, sets the announced deflection on his sight and alines the aiming posts with the vertical line of the mortar sight. He then announces UP.

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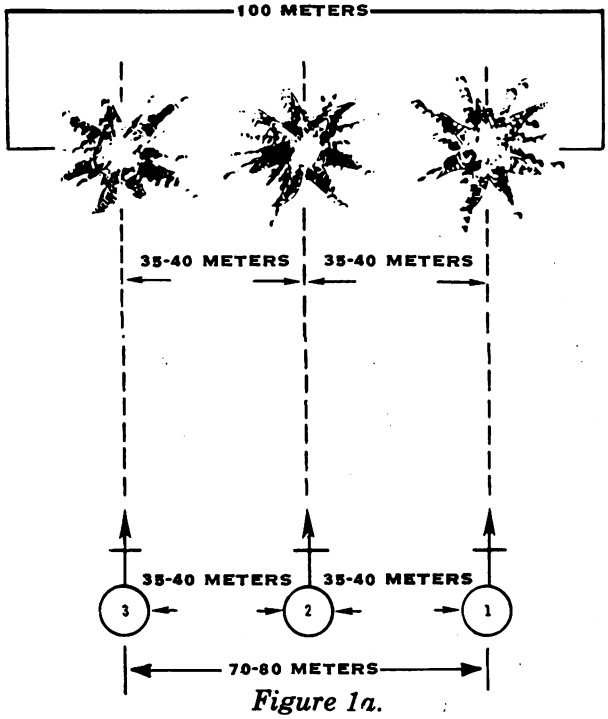

Figure 1a.

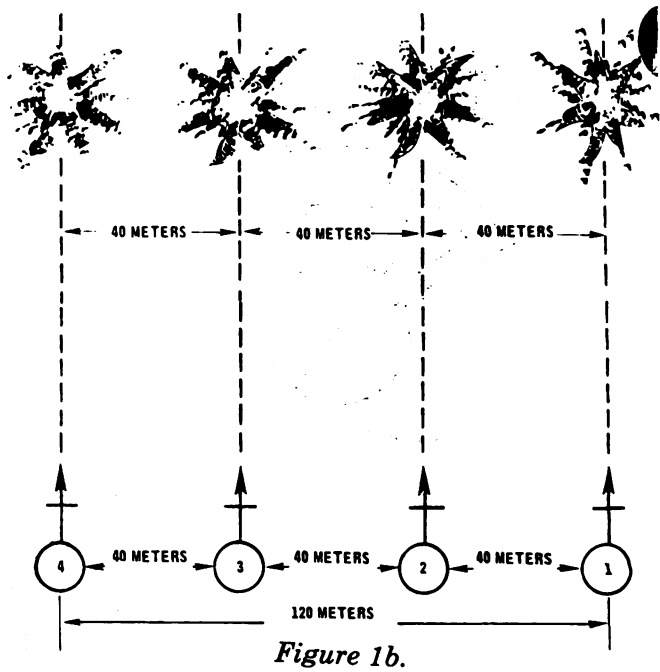

Figure 1b.

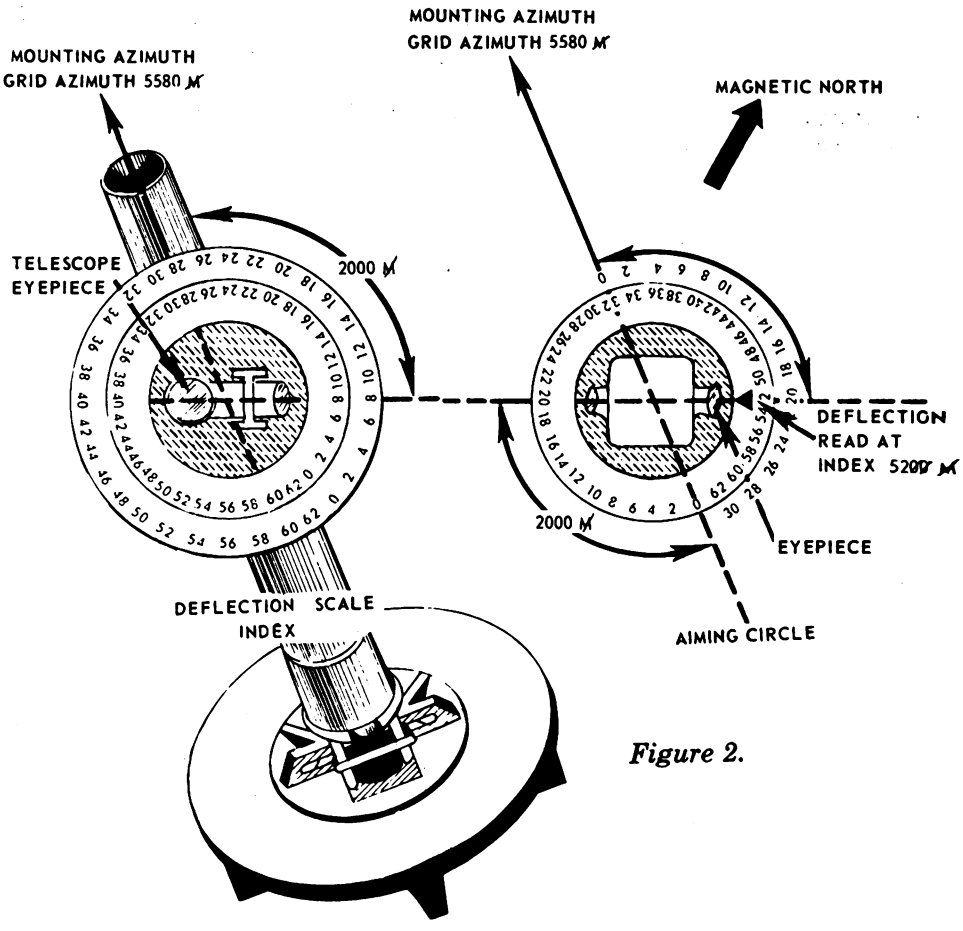

Figure 2.

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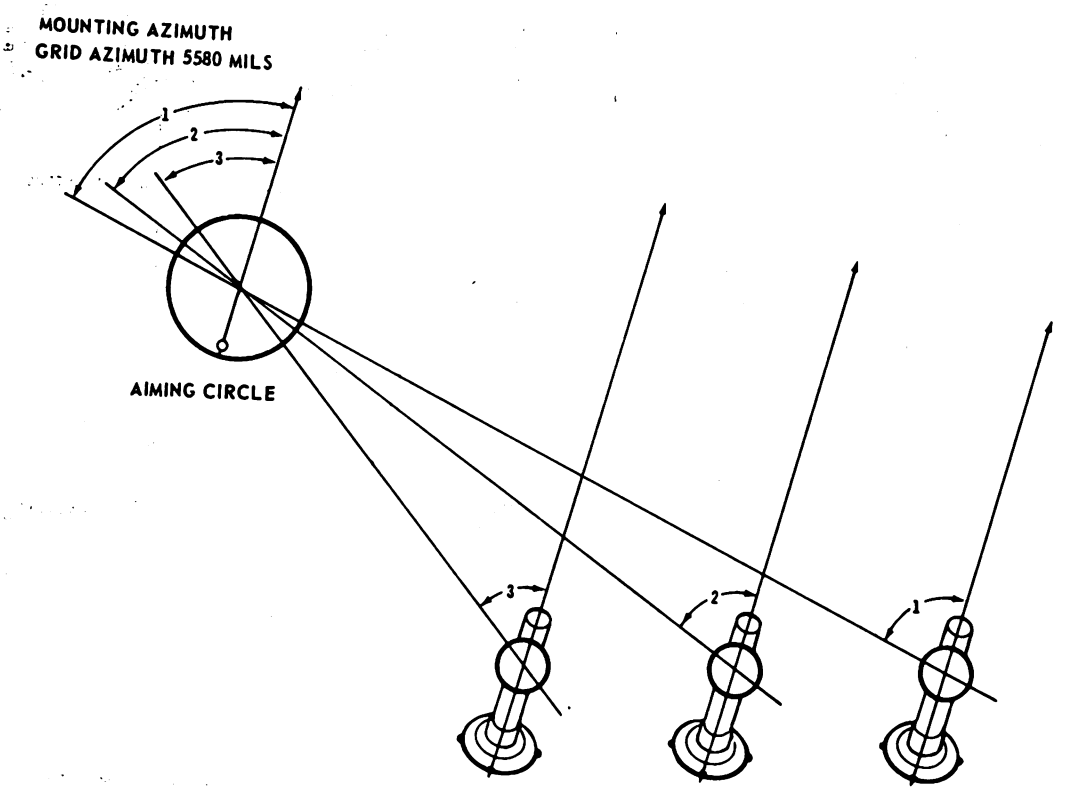

Figure 3a.

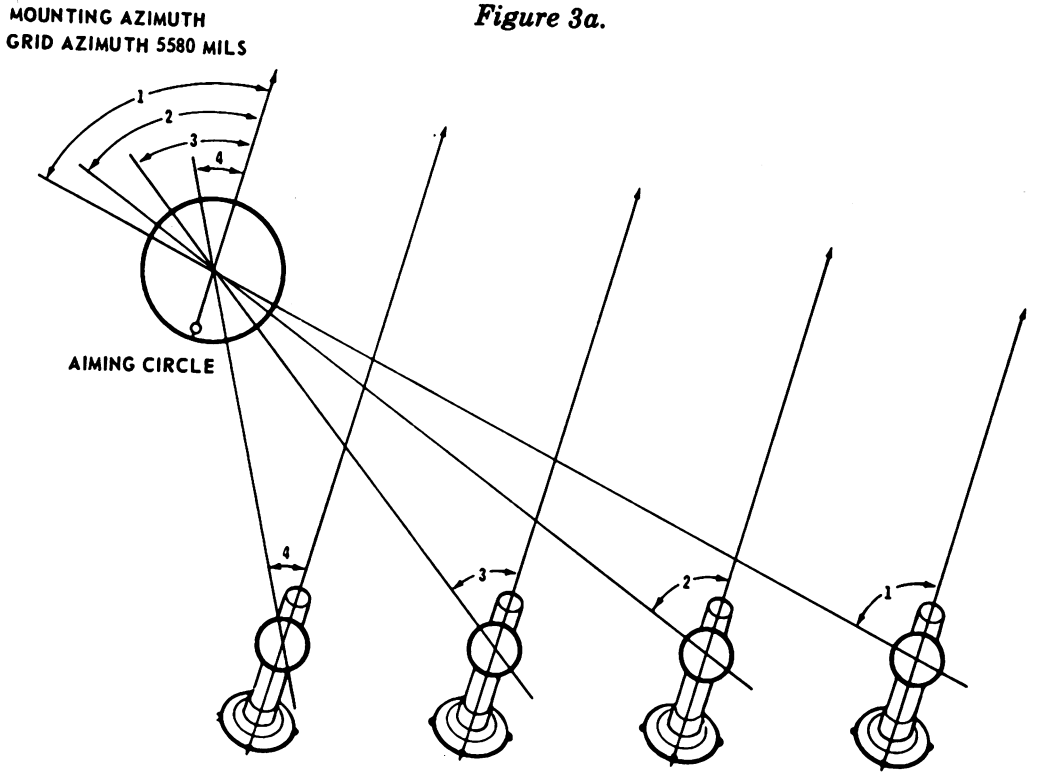

Figure 3b.

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(n) When all gunners announce UP, the section/squad leader covers the head of the aiming circle, but leaves the instrument in position to permit a rapid recheck of any mortar if necessary.

d. **Reciprocal laying on a magnetic azimuth.** Although the section is normally laid parallel on a grid azimuth, it can be laid parallel on a magnetic azimuth by:

(1) Subtracting the magnetic mounting azimuth from 6400 and setting the remainder on the azimuth and micrometer scales of the aiming circle.

(2) Orienting the instrument as described for the aiming circle.

(3) Laying the section as described in paragraph 3b above.

c. **Reciprocal laying using the orienting angle.** The mortars can be laid parallel more accurately if the section leader lays the section parallel by using the orienting angle.

(1) Set up and level the aiming circle.

(2) Orient the aiming circle to the end of orienting line (EOL).

(3) Lay the section as described in paragraph 3b above.

TASK NUMBER: 071-11C-3924

REFERENCES:

FM 23-90, 81-mm Mortar

FM 23-92, 4.2-in Mortar, M30

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TASK

LAY MORTAR FOR DIRECTION USING M2 COMPASS (GROUND MOUNTED).

EVALUATION

CONDITIONS:

Given an M2 compass, a prescribed azimuth, squad members, ground mounted mortar complete with sight, aiming post, and baseplate stake.

STANDARDS:

Baseplate stake will be positioned where mortar is to be mounted and directional stakes will be alined to within 10 mils of the prescribed mounting azimuth.

TRAINING

1. Reciprocal laying using the M2 compass. A fast way to lay the section parallel is to use the compass. Use it only when an aiming circle is not available or when time dictates. It is not as accurate as the other methods.

a. Before mounting the mortars, each squad leader puts a base stake in the ground to mark the location of his mortar.

b. The section leader announces the desired mounting azimuth as MOUNT MORTARS, MAGNETIC AZIMUTH 2200.

c. Each squad leader places his compass on the base stake marking the location of his mortar and orients the compass on the mounting azimuth. By sighting through the compass, he directs the second ammunition handler in alining the aiming posts along the mounting (magnetic) azimuth.

d. Each mortar is then mounted and laid on the aiming posts with a deflection of 3200 (zero on the M34A2 sight) set on the sight. If no mechanical or human error exists, the mortars are now laid parallel. However, both types of error will usually occur.

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NOTE: As there are differences in compasses, the section sergeant may direct that all mortars be laid with one compass. This avoids some error. It is also possible to lay the base mortar only as described above and then lay the other mortars parallel using the mortar sight method. In any event, use the compass method only when the aiming circle or mortar sight method is not feasible.

TASK NUMBER: 071-11C-3925

REFERENCES:

FM 23-90, 81-mm Mortar
FM 23-92, 4.2-in Mortar, M30

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TRAINING AND EVALUATION OUTLINE

TASK

LAY MORTAR FOR DIRECTION USING M2 COMPASS (CARRIER MOUNTED).

EVALUATION

CONDITIONS:

Given an M2 compass, a prescribed azimuth, squad members, carrier-mounted mortar complete with sight, aiming post, and baseplate stake.

STANDARDS:

Baseplate stake will be positoned where mortar is to be mounted and directional stakes will be alined to within 10 mils of the prescribed mounting azimuth.

TRAINING

1. Although the mortars on a mounting azimuth with the M2 compass is not as accurate as the aiming circle method, it does permit the squad to begin an adjustment on a target very quickly.

2. The squad leader places his compass on a steady object located away from the carrier or any metal object that could affect the compass needle. He uses the compass as an aiming point for the base mortar.

a. The carrier is moved into position and the mortar is pointed in the direction of fire indicated by the squad leader. The squad then:

(1) Measures the grid azimuth to the sight of the base mortar.

(2) Subtracts the grid azimuth on which the mortar is to be laid from the grid azimuth, which is measured to the mortar (adding 6400, if necessary).

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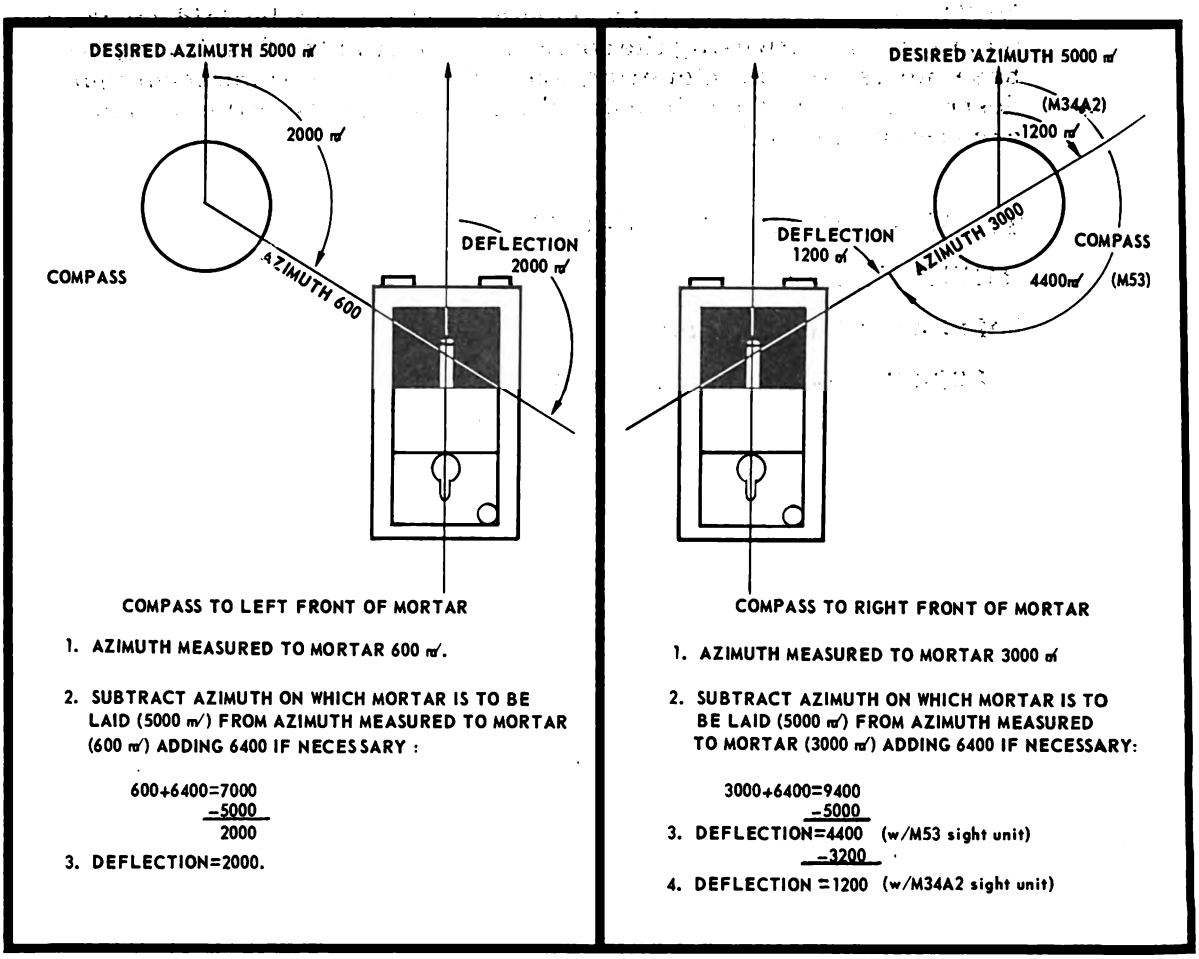
DESIRED AZIMUTH 5000 ㎜
2000 ㎜
COMPASS
AZIMUTH 600
DEFLECTION
2000 ㎜
COMPASS TO LEFT FRONT OF MORTAR
1. AZIMUTH MEASURED TO MORTAR 600 ㎜.
2. SUBTRACT AZIMUTH ON WHICH MORTAR IS TO BE LAID (5000 ㎜) FROM AZIMUTH MEASURED TO MORTAR (600 ㎜) ADDING 6400 IF NECESSARY :
600+6400=7000
−5000
2000
3. DEFLECTION=2000.
DESIRED AZIMUTH 5000 ㎜
(M34A2)
1200 ㎜
DEFLECTION
1200 ㎜
AZIMUTH 3000
COMPASS
4400㎜
(M53)
COMPASS TO RIGHT FRONT OF MORTAR
1. AZIMUTH MEASURED TO MORTAR 3000 ㎜
2. SUBTRACT AZIMUTH ON WHICH MORTAR IS TO BE LAID (5000 ㎜) FROM AZIMUTH MEASURED TO MORTAR (3000 ㎜) ADDING 6400 IF NECESSARY:
3000+6400=9400
−5000
3. DEFLECTION=4400 (w/M53 sight unit)
−3200
4. DEFLECTION =1200 (w/M34A2 sight unit)

Figure 1. Squad laying on initial azimuth, compass mil method.

(3) Announces the remainder (subtracting 3200, if necessary when using the M34A2 sight) as DEFLECTION (figure 1).

b. The gunner sets the announced deflection on his sight and lays on the aiming point - the compass (figure 1). Insuring that the traversing assembly slide is centered and that the mortar is centered to the rear of the carrier, he directs the driver to pivot the carrier track until the approximately correct sight picture of the compass is obtained. With the assistant gunner, the gunner traverses and cross-levels the mortar until the correct sight picture of the compass is obtained. (The correction for the mortar locking pin assembly should be within two turns of center.) Only one lay is required when the M2 compass is used. The mortar is now laid on the approximate grid azimuth.

3. During the brief time required to lay the mortar, the ammunition handler moves out with the aiming posts. The gunner then guides the ammunition handler in placing out the aiming posts.

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NOTE: The carrier-mounted mortar section can be laid on the mounting azimuth using the compass-mil method by first laying the base mortar on the mounting azimuth using the same technique described above. Then, by using the mortar sight, the other mortars are reciprocally laid.

TASK NUMBER: 071-11C-3926

REFERENCES:

FM 23-90, 81-mm Mortar

FM 23-92, 4.2-Inch Mortar, M30

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TASK

SUPERVISE SQUAD DURING THE CONDUCT OF FIRE.

EVALUATION

CONDITIONS:

Given a mounted mortar complete with sights and aiming posts, squad members, and an actual or training situation.

STANDARDS:

Supervise your squad during conduct of fire for an actual or simulated mission to include positioning yourself so that the following are accomplished:

1. Command and control of squad.
2. Construction of mortar position.
3. Emplacement of mortar.
4. Laying the mortar.
5. Communications are established and maintained.
6. Boresighting mortar.
7. Issuing fire commands (if appropriate).
8. Adequate and balanced stock of ammunition is on hand.
9. Ammunition stored.

TRAINING

The squad leader's duties include but are not limited to:

1. Positioning yourself so that you properly command and control your squad.

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2. Supervision of the construction of the mortar position as outlined in task: Construct mortar postion, page 2-II-A-7.

3. Supervise the emplacement of the mortar so that all premount and prefire safety checks are accomplished as outlined in task: Perform safety checks on 81-mm mortar, pages 2-VIII-A-3/2-VIII-B-3 and Perform safety checks on 107-mm (4.2-in) mortar, pages 2-VIII-C-3/2-VIII-D-3.

4. Supervise the laying of the mortar to include referring the sight to the announced referred deflection and placement of the aiming post as outlined in task: Reciprocally lay mortar using M2 aiming circle and place out aiming post, pages 2-VIII-A-10/2-VIII-B-10/2-VIII-C-9/2-VIII-D-9.

5. Supervise the establishment and maintenance of communications as outlined in tasks: Maintain field telephone (TA-1 and TA-312), page 2-VI-B-1; and Install/operate field telephones (TA-1 and TA-312), page 2-VI-B-2.

6. Supervise the boresighting of the mortar using M45 boresight or an alternate method as outlined in task: Boresight 81-mm mortar, pages 2-VIII-A-2/2-VIII-B-2 and Boresight 107-mm (4.2-in) mortar, pages 2-VIII-C-2/2-VIII-D-2.

7. Issue normal or modified fire commands when using fire without FDC or recording fire command data as sent by FDC.

8. Insure that your squad has an adequate and balanced stock of ammunition as specified by unit SOP. Ammunition requests are submitted though your section/platoon sergeant.

TASK NUMBER: 071-11C-3927

REFERENCES:

None

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CHAPTER 2

INDIRECT FIRE INFANTRYMAN

SECTION IX

LEADERSHIP AND TRAINING

TRAINING AND EVALUATION OUTLINES

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TRAINING AND EVALUATION OUTLINE

TASK
INSPECT PERSONNEL/EQUIPMENT.

EVALUATION

CONDITIONS:

Given personnel or equipment to be inspected, specified amount of time, inspection site and unit SOP for inspections.

STANDARDS:

Within the time specified by supervisor, find and note deficiencies on personnel or equipment inspected.

TRAINING

1. Personnel

a. Start at the head. Check headgear, haircut, and shave.

b. Inspect collar insignia and awards.

c. Check gig line and belt buckle.

d. Check footgear.

e. Check uniform for general appearance, fit and patches.

NOTE: Before inspecting, be thoroughly familiar with unit standards.

2. Equipment:

a. Before inspection, study applicable TM. Pay particular attention to section on preventive maintenance checks and services and the basic issue items list.

b. Begin inspection at a readily recognizable point on equipment.

c. Inspect in an orderly sequence. This saves motion and eliminates chances of missing important items.

d. Note deficiencies as you find them. Don't try to remember all of them.

e. Inspection should be complete when you return to the starting point.

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TASK NUMBER: 071-11A-5301

REFERENCES: FM 22-5, Drill and Ceremonies
Unit SOP

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TRAINING AND EVALUATION OUTLINE

TASK
SUPERVISE MAINTENANCE
ON INDIVIDUAL AND TOE EQUIPMENT

EVALUATION

CONDITIONS:

Given personnel, with equipment to be maintained, a maintenance site, and specified amount of time.

STANDARDS:

Within time specified by supervisor, direct personnel assigned to your unit in the proper maintenance of individual or TOE equipment to meet Army standards as listed in applicable TM or other publications.

TRAINING

To supervise maintenance on individual and TOE equipment:

1. Determine what is to be maintained.
2. Obtain applicable TM.
3. Brief personnel on maintenance to be performed and standards.
4. Assign tasks as stated in TM, when applicable.
5. Allocate resources if necessary.
6. Spot check (DO NOT OVER-SUPERVISE).
7. Obtain assistance if needed.
8. Inspect completed work and make corrections if necessary.
9. Report completion of work to your supervisor.

NOTE: Be sure that the task is understood, supervised, and accomplished.

TASK NUMBER: 071-11A-5302

REFERENCES:

FM 22-100, Military Leadership
DA Pamphlet 310-1, Index of Administrative Publications

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TASK

ENFORCE PREVENTIVE MEDICINE PROGRAM (INCLUDES PERSONAL HYGIENE).

EVALUATION

CONDITIONS:

Your squad has been given the mission to conduct an overnight march. As squad leader, brief your men on preventive medicine measures that should be taken.

STANDARDS:

Prior to conduct of the mission, you will explain preventive medicine measures for:

1. Care of the feet prior to and during the march.

2. Purifying water with iodine tablets.

3. Disposal of human waste while on the march and during bivouac.

4. Climatological injuries, heat/cold. During conduct of the mission, inspect your subordinates to insure that they are complying with your instructions. Detect all failures to comply with your instructions and insure corrections are made.

TRAINING

1. Care of the Feet.

a. Prior to the march, all men should be equipped with the proper type of correctly fitted, broken-in footgear correctly fitted, clean socks which are free of holes or knotty darns, and an adequate supply of foot powder. A soldier must never attempt to break in a new pair of shoes or boots on a long march. Blisters (figure 1), pressure spots, and infections should be treated and properly protected before the march starts.

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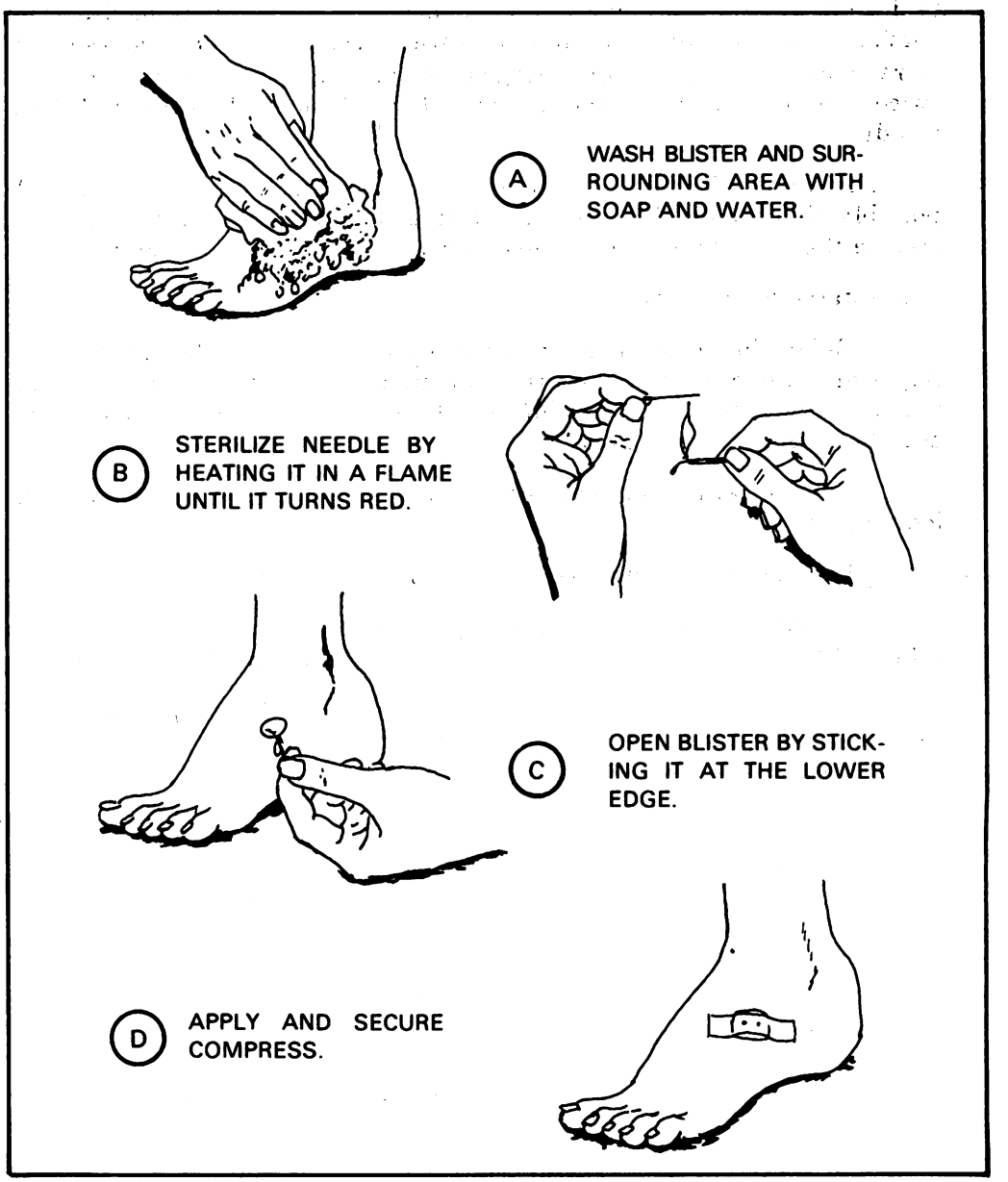
A
WASH BLISTER AND SURROUNDING AREA WITH SOAP AND WATER.
B
STERILIZE NEEDLE BY HEATING IT IN A FLAME UNTIL IT TURNS RED.
C
OPEN BLISTER BY STICKING IT AT THE LOWER EDGE.
D
APPLY AND SECURE COMPRESS.

Figure 1.

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b. On the march, the feet should be kept as dry as possible. If socks become damp from perspiration or wet from water, they should be changed to dry ones at the first opportunity. If necessary, socks may be dried by putting them under the shirt around the waist. Tender pressure spots should be relieved promptly by adjusting gear or applying adhesive tape. Once or twice daily during the march, the feet should be dusted lightly with foot powder.

c. At rest periods, the feet should be inspected (from time to time). If possible, the feet should be washed during the noon break. It is helpful to elevate the feet while resting. This reduces congestion and swelling.

2. Purifying Water.

a. Before iodine tablets are used, they should first be checked for physical change, as they lose their disinfecting ability in time. Tablets which are not steel gray in color, which are stuck together, or which are crumbled should not be used.

b. The following procedure is used in treating water in a canteen with iodine tablets.

(1) Fill canteen with the cleanest, clearest water available.

(2) Add one iodine tablet to a 1-quart canteen of clear water; add two tablets if the water is cloudy. Double these amounts for a 2-quart canteen.

(3) Place the cap on the canteen loosely, wait 5 minutes then shake the canteen well, allowing leakage to rinse the threads around the neck of the canteen.

(4) Tighten cap and wait an additional 20 minutes before using the water for any purpose.

3. Human Solid Waste Disposal.

a. When on the march, each person uses a "cat-hole" latrine during short halts. It is dug approximately 1-foot deep and is completely covered and packed down after use.

b. For overnight bivouac, the straddle trench is used (figure 2). Construction requirements are found in FM 21-10, paragraph 76.

4. Climatological Injuries.

a. Preventing heat injuries:

(1) Water requirements: The human body cannot be trained to function with less than the minimum amount of water it requires for cooling, waste elimination, and metabolism; any attempt to train the body to do so can be harmful and lead to heat injuries. Troops should be encouraged to drink water more frequently than is necessary to quench sensations of thirst.

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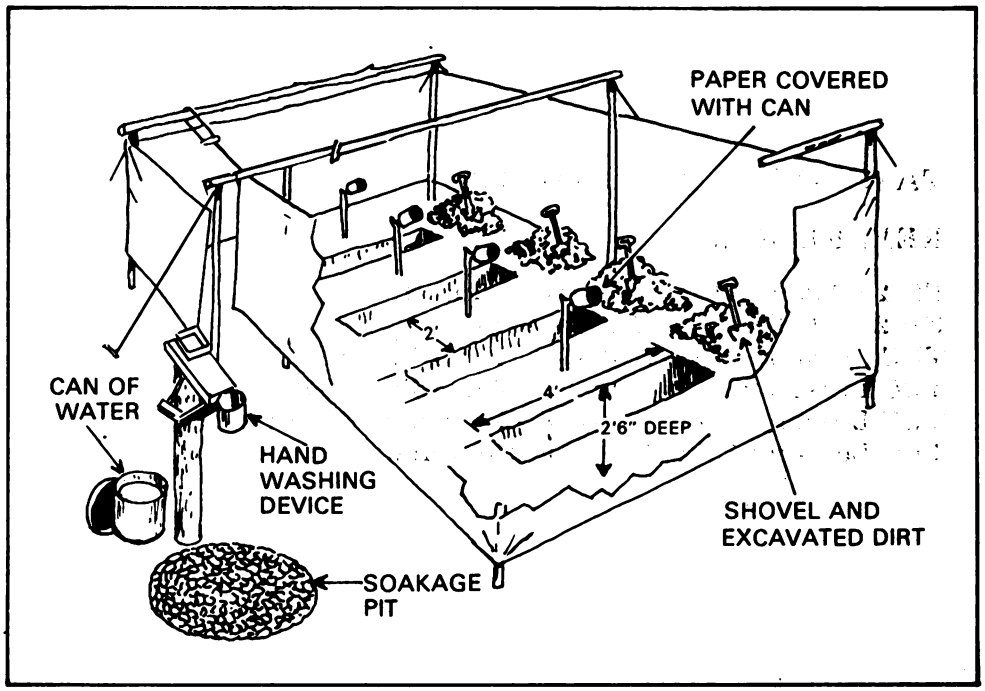

Figure 2.

(2) Salt requirements: When water is lost through perspiration, vital body salt is also lost. An ordinary diet contains enough salt to make up for this loss when a person's water intake is less than 1 gallon a day. If daily water intake increases, the soldier should lightly salt his food from his field rations pack.

NOTE: First-aid for heat injuries is found in FM 21-11.

b. Preventing cold injuries:

(1) Clothing for cold weather is designed to afford protection, insulation, and ventilation; protection by covering as large an area of the body as possible; insulation by trapping air which has been warmed by the body and holding it near the skin to prevent loss of heat from the body; ventilation by allowing a two-way exchange of air through the various layers of clothing. This exchange of air prevents overheating and excessive perspiring. Clothing should be worn in layers and loose enough to allow movement and exercise of hands, feet, and other parts of the body. The clothing should also be clean and dry.

(2) Good circulation should be maintained by exercising the feet and legs. This is especially important during rest breaks.

(3) It is advisable that troops in cold weather be paired as "buddies", each having the responsibilities for reminding the other to take warming exercises at frequent intervals and watching for signs of frostbite and trench foot. FM 21-11 gives signs and first-aid for cold-weather injuries.

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TASK NUMBER: 071-11A-5304

REFERENCES:

FM 21-10, Field Hygiene and Sanitation
FM 21-11, First Aid for Soldiers
TEC Lesson 929-441-0044F, Care of Feet
TEC Lesson 929-441-0043F, Water Purification
TEC Lesson 929-441-0041F, Disease Prevention
TEC Lesson 919-441-0034F, Heat and Cold

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TRAINING AND EVALUATION OUTLINE

TASK

SUPERVISE SUBORDINATES.

EVALUATION

CONDITIONS:

Given a mission and resources, to include subordinates, time, and materials.

STANDARD:

Accomplish the mission within the required time and to the established standards.

TRAINING

1. Understand the mission. Ask questions if necessary.

2. Explain the mission to subordinates, insuring the explanation is clear, concise, and complete to include standards.

3. Allocate resources (subordinates, time, and materials).

4. Assign specific tasks to each subordinate.

5. Solicit and consider ideas from subordinates (mission and time permitting).

6. Allow subordinates to learn by doing (mission and time permitting).

7. Do not be overly fearful of mistakes.

8. Do not oversupervise nor undersupervise. Recognize subordinates' capabilities (know your subordinates).

9. Check progress and quality periodically.

10. Be decisive.

11. Inspect completed assignment.

12. Recognize subordinates upon mission accomplishment.

13. Report mission accomplishment through the chain of command.

TASK NUMBER: 071-11A-5305

REFERENCE:

FM 22-100, Military Leadership

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TRAINING AND EVALUATION OUTLINE

TASK

CONDUCT A PERFORMANCE-ORIENTED TRAINING SESSION.

EVALUATION

CONDITIONS:

Given:

1. A training objective with the following characteristics:

   a. It must be an **individual** training objective.

   b. It must not require the mastery of any intermediate training objective.

   c. It must be teachable within 30 minutes and judged by an individual (your evaluator/supervisor) who has demonstrated mastery of the training objective.

2. No more than 24 hours to prepare the training session.

3. No more than 10 and no less than four trainees who are unable to perform the training objective.

4. No more than 30 minutes to conduct the training session.

5. All other necessary resources to conduct the training (for example, training aids, an area to conduct the training, etc.).

STANDARDS:

1. The trainer must conduct the training in three phases. In Phase I, he must:

   a. Explain the training objective.

   b. Insure all trainees understand the training objective.

   c. Give appropriate instruction (e.g., demonstration, talk thru) to prepare the trainees to perform the training objective.

2. In Phase II, he must give the trainees sufficient time to practice performing.

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3. Phase III, he must test the trainee's ability to perform the training objective.

4. All trainees who cannot perform the training objective at the conclusion of the training session must be identified.

5. The reason(s) for the failure(s) must be identified.

TRAINING:

1. Insure that you clearly understand the training objective which you are to teach. If you have any questions, ask your evaluator/supervisor.

a. During Phase I, you inform the trainees. This includes explaining the training objective, insuring understanding and a demonstration. (You may decide to talk the trainees through the task instead of first demonstrating it.) Explanation of the training objective must include: the task which the trainees perform at the end of the session, the conditions under which they must operate (for example, equipment given or denied and terrain), and the standard that they must achieve. Estimate the time it will take to complete Phase I.

b. In Phase II, you allow the trainees to practice performing the training objective. (Do not estimate the amount of time required for this phase at this time.)

c. In Phase III, you test the trainees to determine if each one can perform the training objective. Estimate the time that it will take to test all trainees. All remaining time will be allocated to Phase II of the training session. If you properly organize available time, all trainees should be able to accomplish the training objective within the time estimated.

2. Obtain any training aids that you need. (You may find it helpful to look in appendix C, FM 21-6, Training Techniques, Aids, and Devices.) If the training objective which you have been given is contained in the Skill Level 1, Soldier's Manual, look at the "training" portion of the training and evaluation outline for your particular training objective. This should also give you some helpful information.

3. Rehearse the training session.

4. Conduct the training session (in three phases as described above).

5. Evaluate the results of the training session. Remember that all trainees must perform the training objective and that it is critical to identify those who cannot. Note the reason(s) for any failure(s). Reasons for failure might be: insufficient resources (time, training aids, etc.); unrealistic standards, or lack of trainee motivation.

TASK NUMBER: 071-11A-5101
REFERENCE:

FM 21-6, How to Prepare and Conduct Military Training

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